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augmentation index estimated by a novel wrist-worn tonometer. *Journal of hypertension* 2018 [Epub ahead of print].

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EFFECT OF UPRIGHT POSTURE ON CENTRAL WAVE REFLECTION IN 637 VOLUNTEERS NOT USING MEDICATIONS WITH DIRECT CARDIOVASCULAR INFLUENCES: DESCRIPTION OF DIFFERENT PHENOTYPES

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Background: The effect of upright posture on the level of augmentation index (Alx) remains controversial [1–3]. Phenotypic differences in Alx responses to upright posture are unknown.

Methods: Altogether 323 women and 315 men without cardiovascular disease and medications with direct cardiovascular influences were subjected to passive head-up tilt (5-min supine, 5-min upright). Haemodynamics were recorded using continuous tonometric pulse wave analysis and whole-body impedance cardiography.

Results: Mean (SD) age was 45.6 (1.2) years, BMI 26.8 (4.4) kg/m², and average blood count, plasma lipids and creatinine were normal. Alx decreased from supine 22.7% (11.9) to upright 13.8% (12.2) ($p < 0.001$), while heart rate related Alx@75 decreased from 17.9% (11.8) to 13.9% (11.0) ($p < 0.001$), respectively. In stepwise linear regression analyses, the explanatory variables for upright reduction in Alx were changes in ejection duration ($\beta = 0.744$), aortic reflection time ($\beta = -0.491$), and stroke volume ($\beta = 0.117$); and supine ejection duration ($\beta = 0.312$), systemic vascular resistance (SVR) ($\beta = -0.271$), pulse wave velocity (PWV) ($\beta = -0.203$), and systolic blood pressure ($\beta = 0.081$) ($p < 0.001$ for all). When divided to quartiles according to the supine-to-upright change in Alx 1) the quartile with lowest supine Alx had highest upright Alx, lowest supine SVR and PWV, and lowest upright heart rate; 2) the quartile with highest supine Alx had lowest upright Alx, highest supine SVR and PWV, and highest upright heart rate.

Conclusions: The level of Alx is decreased in the upright position. The phenotypic differences in the supine-to-upright change in Alx may explain why this variable has not predicted cardiovascular events in all endpoint studies.

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P16

PULSE WAVE VELOCITY AND ITS ASSOCIATION WITH FIRST CARDIOVASCULAR EVENTS IN A PORTUGUESE HYPERTENSIVE SAMPLE

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Objective: Pulse Wave Velocity (PWV) is considered a marker of cardiovascular (CV) risk prognosis. The objective was to evaluate the association of PWV, other features and CV events in a sample of hypertensive patients.

Design and method: We studied 314 hypertensive patients without previous CV events evaluated by PWV in a Portuguese average-size hospital, through its descriptive and survival analysis.

Results: Of the 314 patients (51% male) ageing 54.0 ± 14.2 years, 31.5% had resistant hypertension, 26.8% were diabetic, 66.6% had hyperlipidaemia, the average body mass index was 28.3 kg m⁻², and 16.6% were active smoker.

Through a follow-up of 2.1 ± 2.2 years, 28 patients (8.9%) had a CV event. Comparison of the patients with PWV ≤ 10 ms⁻¹ and the patients with PWV > 10 ms⁻¹, showed statistical significance for age (64.3 ± 10.5 vs 50.2 ± 13.4 years, $p < 0.0001$), casual systolic blood pressure (137.4 ± 16.3 mmHg vs 154.4 ± 21.4 mmHg, $p < 0.0001$), PWV (7.9 ± 1.2 ms⁻¹ vs 12.2 ± 1.9 ms⁻¹, $p < 0.0001$) left ventricular hypertrophy (193.3 ± 58.6 vs 235.8 ± 65.1, $p < 0.01$) and left auricular volume (19.9 ± 3.9 vs 23.3 ± 5.8, $p < 0.002$). Patients with PWV > 10 ms⁻¹, 77.3% had left ventricular hypertrophy ($p < 0.004$) and 70% had left auricular enlargement ($p < 0.08$). In the survival analysis, the Kaplan Meier curve showed a worse prognosis for CV events with PWV > 10 ms⁻¹ (log rank 6.0, $p < 0.014$).

Conclusions: Higher PWV indicating worse artery damage is associated with end organ damage like left ventricular hypertrophy and left auricular enlargement. In patients with no previous CV events, PWV > 10 ms⁻¹ is an indicator for worse prognosis for CV events.

P17

ARTERIAL STIFFNESS OF THE FOREARM IS ASSOCIATED WITH NAILFOLD CAPILLARY COUNT IN SYSTEMIC SCLEROSIS: A NOVEL MARKER OF EARLY VASCULOPATHY?

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Background: Microvascular disease, with rarefaction of nailfold capillaries, is the hallmark of systemic sclerosis (SSc). Obliteration of the ulnar and radial artery is regularly observed, implicating involvement of the forearm arteries. Pulse wave velocity (PWV) may serve as early biomarker of forearm artery involvement, before occurrence of irreversible arterial obliteration.

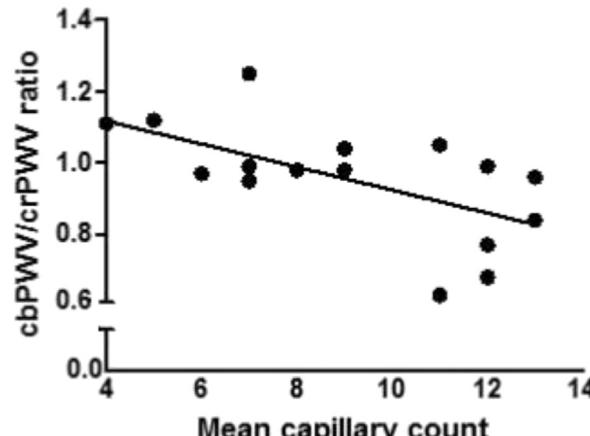
Objectives: The aim was to investigate arterial stiffness of the aorta and the upper extremities in SSc patients and to correlate these findings with nailfold capillary count and extent of disease.

Methods: Aortic PWV was defined as carotid-femoral (cf). Upper extremity PWV was measured as carotid-brachial (cb) and carotid-radial (cr), the ratio between cbPWV/crPWV was used as an indication of the relative PWV change in the forearm. Capillary count was the mean capillary count per 3 mm of 8 fingers. The number of SSc classification criteria was used as surrogate for extent of disease. [1]

Results: In total, 19 SSc patients (median age 51 years, 68% female) were included. CbPWV/crPWV ratio correlated strongly with capillary count ($r = -0.55$, $p = 0.022$, figure 1) in SSc patients, with a trend in regards to its relation with the extent of disease ($r = 0.48$, $p = 0.053$).

Conclusions: Our findings demonstrate that arterial stiffness of the forearm has a relationship with nailfold capillary count and tends to be associated with the extent of disease in patients with SSc. These may suggest that vascular damage also occurs in larger arteries of the forearm, which potentially serves as novel tool for assessing early vascular involvement in SSc.

Correlation between cbPWV/crPWV and capillary count



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P18

AORTIC STIFFNESS IN AORTIC STENOSIS: SHORT TERM HEMODYNAMIC CHANGES AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION

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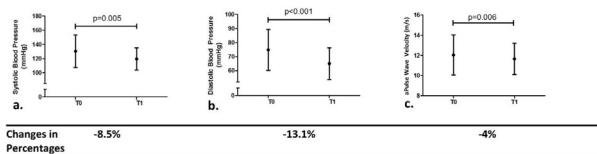
Background: Both aortic valve stenosis and aortic stiffness are moderators of arterio-ventricular coupling and independent predictors of cardiovascular morbidity and mortality. Studies on the effect of Transcatheter Aortic Valve Implantation (TAVI) on hemodynamic parameters are limited. We performed a pilot study to investigate possible short-term hemodynamic changes after TAVI in older patients.

Methods: TAVI Care & Cure is an observational ongoing study including consecutive patients undergoing TAVI procedure. Central and peripheral hemodynamic measurements were measured non-invasively 1 day before (T0) and 1 day after (T1) TAVI using a validated oscillometric method using a brachial cuff (Mobil-O-Graph).

Results: 40 patients were included. Mean aortic valve area at baseline was $0.73 \pm 0.18 \text{ cm}^2$. As expected indices of severity of the aortic valve stenosis improved. Systolic blood pressure (SBP) dropped by 8.5%, from $130.3 \pm 22.9 \text{ mmHg}$ to $119.5 \pm 15.8 \text{ mmHg}$ ($p = 0.005$). Diastolic blood pressure (DBP) dropped by 13.1% from $74.8 \pm 14.5 \text{ mmHg}$ to $65.0 \pm 11.3 \text{ mmHg}$ ($p < 0.001$). The aPulse Wave Velocity (aPWV) decreased from $12.05 \pm 1.99 \text{ m/s}$ to $11.6 \pm 1.56 \text{ m/s}$ ($p = 0.006$) (Fig. 1). Patients with high aPWV at baseline showed a significantly larger reduction in SBP in comparison to patients with low aPWV: - 20.3 mmHg (-14.1%) vs - 3.1 mmHg (-2.6%), respectively ($p = 0.03$). The same trend was found for the DBP: - 16.2 (-20.4%) v.s. - 4.5 mmHg (-6.3%) for high vs. low aPWV at baseline ($p=0.037$).

Conclusion: We found short term changes of blood pressure and aortic stiffness after TAVI. The amplitude of the changes was the largest in patients with elevated aortic stiffness at baseline.

Figure 1: Changes of hemodynamic parameters after TAVI: Systolic Blood Pressure (a), Diastolic Blood Pressure (b) and aPulse Wave Velocity (c)



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EFFECT OF GROWTH HORMONE REPLACEMENT IN THE VASCULAR SYSTEM OF ADULT PATIENTS WITH CHILDHOOD ONSET HYPOPIITUITARISM

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Objective: To evaluate the human recombinant growth hormone replacement (rhGHR) in the metabolic parameters and vascular system in adult patients with childhood onset hypopituitarism (COH).

Patients and methods: Fifty-one adult with COH were selected for the study. They were divided into 2 groups: 1- rhGHR: 13 male, 14 female with median age 33.2 yrs, rhGHR in adult life with 7.38 yrs median time; 2 - Without rhGHR: 13 male, 11 female with 36.9 yrs median age and without

rhGHR in adult life of 10.4 yrs median time. Anthropometric parameters, dual-energy X-ray absorptiometry (DEXA), lipid and glycemic profile, and structural and functional parameters of the arterial vessels (carotid intima media thickness, arterial stiffness and flow mediated dilation) were evaluated.

Results: The diagnosis of obesity and overweight was higher in patients without rhGHR. Among the anthropometric characteristics, the waist-to-height ratio and diastolic blood pressure were higher in patients without replacement ($p = 0.03$ and $p = 0.019$, respectively). In the evaluation of body composition through DEXA, the Fat Mass Index among patients under rhGHR was significantly lower than in patients without rhGHR ($p = 0.029$). Although no statistical difference in the vascular parameters between patients with and without rhGHR, it was observed a trend towards a higher arterial stiffness in the group without replacement ($p = 0.051$). In the group of patients without rhGHR, arterial stiffness had a significant and positive correlation with the time without rhGHR ($p = 0.038$).

Conclusions: These data suggest that the rhGHR in adults with COH may have protective effects on cardiovascular system.

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BRACHIAL AND RADIAL SYSTOLIC BLOOD PRESSURE ARE NOT THE SAME: POTENTIAL IMPLICATIONS FOR VALIDATION PROTOCOLS INCLUDING BRACHIAL CUFF DEVICES AND WRIST-BASED WEARABLES

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Introduction: Radial intra-arterial blood pressure (BP) is sometimes used as the reference standard for validation of brachial cuff BP devices, and there is an emerging 'wearables' market seeking to measure BP at the wrist. However, brachial systolic BP may not be a good representation of the radial systolic BP, and this could have implications for appropriate BP validation protocols. This study sought to determine the difference between brachial and radial systolic BP.

Methods: Intra-arterial BP was measured consecutively at the brachial and radial arteries in 168 participants undergoing coronary angiography (aged 62 ± 10 years, 69% male). Intra-arterial BP recordings were made via fluid filled catheter according to guideline recommendations.

Results: Brachial systolic BP was lower than radial systolic BP ($136.5 \pm 14.3 \text{ mmHg}$; $p < 0.001$). Only 40% of participants had a brachial systolic BP within $\pm 5 \text{ mmHg}$ to radial systolic BP ($138.1 \pm 138.5 \text{ mmHg}$, $p = 0.15$). Additionally, 25% and 17% of participants had systolic BP differences of 5 to 10 mmHg ($132.7 \pm 139.9 \text{ mmHg}$ respectively, $p < 0.001$) and 10 to 15 mmHg ($132.2 \pm 144.4 \text{ mmHg}$ respectively; $p < 0.001$). A further 18% had systolic BP differences $> 15 \text{ mmHg}$ ($140.3 \pm 161.3 \text{ mmHg}$; $p < 0.001$).

Conclusion: Radial systolic BP is not representative of brachial systolic BP, with the majority of participants having a systolic BP difference greater than 5 mmHg between brachial and radial arteries. Therefore, if validation testing of BP devices is performed with intra-arterial BP as the reference standard, this should be undertaken at the same site as the brachial cuff or wrist based wearable device.

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CHARACTERIZATION OF AN ATHEROSCLEROTIC PHENOTYPE

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Background: Interaction between genetics and epigenetics has been largely described in Atherosclerotic Disease and the relations varies widely according to the population, clinical characteristics and the study type.

Objective: Compare genetic and epigenetic factors in two middle age populations with and without plaques.

Methods: A retrospective cohort study from a database of 6381 p. first ever Non Invasive Vascular Evaluations (NIVE) (IMT, plaques, PWV and Endothelial Function (EF)). We analyzed 1876 p. 40–45 y.o. (29.4%) and particularly 179 (2, 8%) without CV Drugs, 80 w/o (P-) and 99 with C-F plaques (P+).