P17: ARTERIAL STIFFNESS OF THE FOREARM IS ASSOCIATED WITH NAILFOLD CAPILLARY COUNT IN SYSTEMIC SCLEROSIS: A NOVEL MARKER OF EARLY VASCULOPATHY?

Anniek van Roon, Amaal Eman Abdulle, Arie van Roon, Saskia van de Zande, Hendrika Bootsma, Andries Smit, Udo Mulder


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P15
EFFECT OF UPRIGHT POSTURE ON CENTRAL WAVE REFLECTION IN 637 VOLUNTEERS NOT USING MEDICATIONS WITH DIRECT CARDIOVASCULAR INFLUENCES: DESCRIPTION OF DIFFERENT PHENOTYPES
Ilkka Porsti 1,2, Mattias Wilenius 2,3, Antti Tikkakoski 1, Arttu Eräanta 3, Manoj Kumar Choudhary 3, Jenni Koskela 3, Anna Tahvanainen 3,4, Jukka Mustonen 3
1University of Tampere, Finland
2Tampere University Hospital, Tampere, Finland
3University of Tampere, Tampere, Finland
4Heart Hospital of Tampere University Hospital, Tampere, Finland

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 AIx75 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 (β = 0.744), aortic reflection time (β = -0.491), and stroke volume (β = 0.117); and supine ejection duration (β =-0.312), systemic vascular resistance (SVR) (β = -0.271), pulse wave velocity (PWV) (β = -0.203), and systolic blood pressure (β = 0.081) (p < 0.001 for all). When divided to quartiles according to the supine-to-upright right 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. Phenotypic differences in the supine-to-upright change in Alx may explain why this variable has not predicted cardiovascular events in all endpoint studies.

References

P16
PULSE WAVE VELOCITY AND ITS ASSOCIATION WITH FIRST CARDIOVASCULAR EVENTS IN A PORTUGUESE HYPERTENSIVE SAMPLE
Clarinda Neves 1,2,3, Joana Ricardo Pires 1, Verônica Ribau 4, José Mesquita Bastos 4,5,6
1Clarinda Neves, Portugal
2Centro Hospitalar Baixo Vouga, Aveiro, Portugal
3Departamento de Ciências MéDICas, Universidade de Aveiro, Portugal
4Centro Hospitalar do Baixo Vouga, Aveiro, Portugal
5ESSUA, Universidade de Aveiro, Portugal
6CINTESIS, Portugal

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 years 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 >10ms⁻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?
Anniek van Roon 1, Amael Eman Abdulle 1, Arie van Roon 1, Saskia van de Zande 1, Hendrika Bootma 1, Andries Smit 1, Udo Mulder 2
1University of Groningen, University Medical Center Groningen, Groningen, the Netherlands
2University of Groningen, University Medical Centre Groningen, Groningen, the Netherlands

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-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.

Results: In total, 19 SSc patients (median age 51 years, 68% female) were included. CB PWV/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.
Results: The diagnosis of obesity and overweight was higher in patients without hrGHr. 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 DXA, the Fat Mass Index among patients under hrGHr was significantly lower than in patients without hrGHr (p = 0.029). Although no statistical difference in the vascular parameters between patients with and without hrGHr, it was observed a trend towards a higher arterial stiffness in the group without replacement (p = 0.051). In the group of patients without hrGHr, arterial stiffness had a significant and positive correlation with the time without hrGHr (p = 0.038).

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

Abstracts

References

P18 AORTIC STIFFNESS IN AORTIC STENOSIS: SHORT TERM HEMODYNAMIC CHANGES AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION
Jeannette Goudzwaard, Nahid El Faquir, Nicolas van Mieghem, Marjo de Rond-Tillmans, Mattie Lenzen, Peter de Jaegere, Francesco Mattace-Raso
Erasmus University Medical Center, Rotterdam, the Netherlands

Background: Both aortic valve stenosis as 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 ± 0.18 cm². As expected indices of severity of the aortic valve stenosis improved. Systolic blood pressure (SBP) dropped by 8.5% from 130.3 ± 22.9 mmHg to 119.5 ± 15.8 mmHg (p = 0.005). Diastolic blood pressure (DBP) dropped by 13.1% from 74.8 ± 12.9 mmHg to 65.0 ± 11.3 mmHg (p < 0.001). The a pulse Wave Velocity (aPWV) decreased from 12.05 ± 1.9 m/s to 11.6 ± 1.56 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 at baseline: -20.4 mmHg (-20.3%) vs. -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.

P20 BRACHIAL AND RADIAL SYSTOLIC BLOOD PRESSURE ARE NOT THE SAME: POTENTIAL IMPLICATIONS FOR VALIDATION PROTOCOLS INCLUDING BRACHIAL CUFF DEVICES AND WRIST-BASED WEARABLES
Matthew Armstrong 1, Martin Schultz 1, Dean Picone 1, James Sharman 1, Nathan Dwyer 2, Philip Roberts-Thomson 2, Andrew Black 2
1Menzies Institute for Medical Research, University of Tasmania, Australia
2Royal Hobart Hospital, Australia

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 patients 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 ± 143.9 mmHg; p < 0.001). Only 40% of participants had a brachial systolic BP within ±5 mmHg to radial systolic BP (138.1 and 138.5 mmHg, p = 0.15). Additionally, 25% and 17% of participants had systolic BP differences of 5 to 10 mmHg (132.7 and 139.9 mmHg respectively, p < 0.001) and 10 to 15 mmHg (132.2 and 144.4 mmHg respectively; p < 0.001). A further 18% had systolic BP differences >15 mmHg (140.3 and 161.3 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.

P19 EFFECT OF GROWTH HORMONE REPLACEMENT IN THE VASCULAR SYSTEM OF ADULT PATIENTS WITH CHILDHOOD ONSET HYPOPTUITIONISM
Isabela Biscotto 1, Valeria Costa-Hong 2, Luiz Bortolotto 2, Luciani Carvalho 2
1Hospital das Clínicas da Faculdade de Medicina da Universidade Sao Paulo, Brasil
2Instituto do coração, Hospital das Clínicas da Faculdade de Medicina da Universidade Sao Paulo, Brasil
3Hospital das Clínicas, da Faculdade de Medicina da Universidade Sao Paulo, Brasil

Objective: To evaluate the human recombinant growth hormone replacement (hrGHr) 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 - hrGHr: 13 male, 14 female with median age 33.2 yrs, rhGHr in adult life with 7.38 yrs median time; 2 - Without hrGHr: 13 male, 11 female with 36.9 yrs median age at and without hrGHr 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 hrGHr. 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 DXA, the Fat Mass Index among patients under hrGHr was significantly lower than in patients without hrGHr (p = 0.029).

Conclusions: Both aortic valve stenosis as 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 ± 0.18 cm². As expected indices of severity of the aortic valve stenosis improved. Systolic blood pressure (SBP) dropped by 8.5% from 130.3 ± 22.9 mmHg to 119.5 ± 15.8 mmHg (p = 0.005). Diastolic blood pressure (DBP) dropped by 13.1% from 74.8 ± 12.9 mmHg to 65.0 ± 11.3 mmHg (p < 0.001). The a pulse Wave Velocity (aPWV) decreased from 12.05 ± 1.9 m/s to 11.6 ± 1.56 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 at baseline: -20.4 mmHg (-20.3%) vs. -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 a pulse Wave Velocity (c)

P21 CHARACTERIZATION OF AN Atherosclerotic PHENOTYPE
Pedro Forcada 1, Castellaro Carlos 1, Sergio Gonzalez 2, Carol Kotliar 2, Sebastian Obregon 1, Jorge Chiabaut Svane 3
1Hospital Austral, Buenos Aires, Argentina
2Cemic, Argentina
3Hospital Churruca, Buenos Aires, Argentina

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 first ever non invasive Vascular Evaluations (NIVE) (IMT, plaques, PWV and Endothelial Function (EF)). We analyzed 1876 patients with and without plaques.

Conclusion: Despite the risks of atherosclerotic diseases are known, the genetics and epigenetics factors that increases this risks is been little characterized.