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P21: CHARACTERIZATION OF AN ATHEROSCLEROTIC PHENOTYPE

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

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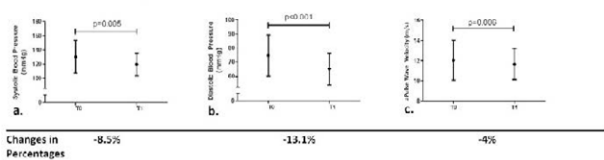
Background: Both aortic valve stenosis as aortic stiffness are moderators of arterio-ventricular coupling and independent predictors of cardiovascular morbidity and mortality. Studies on the effect of transcatheter aortic valve implantation (TAVI) on hemodynamic parameters are limited. We performed a 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 $0.73 \pm 0.18 \text{ cm}^2$. 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 ($p = 0.033$). 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)



P19

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

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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 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 DEXA, 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.

P20

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 vs 143.9 mmHg ; $p < 0.001$). Only 40% of participants had a brachial systolic BP within $\pm 5 \text{ mmHg}$ 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 $> 15 \text{ mmHg}$ (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.

P21

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+).

Results: The proportion of males (54 vs 76%), Family history + (42 vs 73%) and smokers (19 vs 30%) were higher in P+. IMT and EF were significantly abnormal but not PWV or CBP in P+.

Conclusion: In a very selective sample of middle age patients, the genetic burden and the functional alterations seem to be closely related to the presence of atherosclerosis suggesting a pathogenetic predominance over epigenetic factors.

Poster Session I – Hypertension I

P22

THE ROLE OF RENAL DYSFUNCTION ON TARGET ORGAN DAMAGE AND CARDIOVASCULAR RISK IN HYPERTENSIVES

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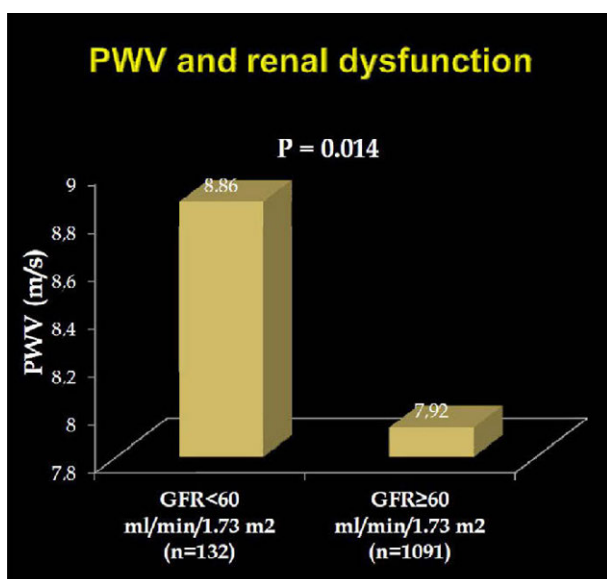
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Purpose/Background/Objective: Hypertension is associated with increased left ventricular (LV) hypertrophy, aortic stiffness and renal dysfunction, which are all predictors of cardiovascular risk. We investigated the effect of renal dysfunction on LV mass and aortic stiffness in hypertensives.

Methods: We enrolled 1223 consecutive hypertensives (mean age 53.0 ± 11.6 years, 726 males). We estimated the glomerular filtration ratio (GFR) using the MDRD formula. We classified our population as hypertensives with moderate to severe renal dysfunction (GFR ≥ 60 ml/min/1.73 m², n = 1091). LV mass index (LVMI) was assessed echocardiographically and calculated using the Devereux formula. Aortic stiffness and wave reflections were assessed with pulse wave velocity (PWV) and augmentation index (AIx), respectively. Ten-year cardiovascular risk was estimated with Framingham Risk score.

Results: After adjustment for age, gender, mean blood pressure, body-mass index, diabetes mellitus, low-density lipoprotein and C-reactive protein hypertensives with GFR < 60 ml/min/1.73 m² compared to hypertensives with GFR ≥ 60 ml/min/1.73 m² had higher PWV levels (8.86 m/s vs. 7.92 m/s, p = 0.014), higher LVMI (119.5 g/m² vs. 114.9 g/m², p = 0.012) and higher AIx (31.1% vs. 27.4%, p = 0.05). On the contrary, hypertensives with GFR < 60 ml/min/1.73 m² had similar 10-year cardiovascular risk compared to hypertensives with GFR ≥ 60 ml/min/1.73 m² (17.3% vs. 13.0%, p = 0.323).

Conclusions: Renal dysfunction is associated with LVMI and aortic stiffness. Hypertensives with moderate to severe renal dysfunction despite having similar 10-year cardiovascular risk with hypertensives with normal renal function or mild renal dysfunction, demonstrate higher aortic stiffness and LV mass, implying a possible underestimation of risk by Framingham.



P23

THE COMPARISON OF PROGNOSTIC VALUE AMONG ANKLE BRACHIAL PRESSURE INDEX, ARTERIAL STIFFNESS AND PRESSURE WAVE REFLECTION IN SUBJECTS WITH CORONARY ARTERY DISEASE

Kazutaka Kimura

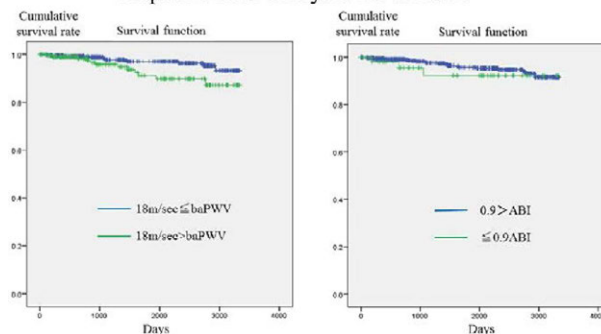
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Objectives: The present retrospective study was conducted to compare the prognostic value among ankle brachial pressure index (ABI), brachial-ankle pulse wave velocity (baPWV,) and radial augmentation index (rAI) in patients with coronary artery disease (CAD).

Methods: ABI, baPWV and rAI were measured in consecutive patients admitted for the management of CAD into our medical university hospital (n = 821, 677 males and 144 females; age 65.4 ± 10.5 years old), and they were followed at the outpatient department. During the follow-up period, events were defined as in-stent restenosis, new lesion of coronary artery sclerosis and MACE (i.e., acute coronary syndrome, cerebral infarction, cerebral bleeding and cardiac death).

Results: Among the study period (4.2 ± 3.0 years), the event of in stent restenosis (n = 99), new lesion of coronary artery sclerosis (n = 77) and MACE (n = 18) were observed respectively. In cox regression analysis after adjustment of age and gender, baPWV > 18m/sec, but not ABI 18 m/sec had significantly higher incidence of MACE (P = 0.021)(Figure). Both baPWV > 18 m/sec (odds 1.61: 95% CI: 1.01 – 2.56, p = 0.044) and ABI

Kaplan-Meier analysis for MACE



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BRACHIAL AND CENTRAL SYSTOLIC BLOOD PRESSURES FROM TWO OSCILLOMETRIC DEVICES (SPHYGMOCOR AND MOBIL-O-GRAPH) OVERESTIMATE HIGH FIDELITY INTRA-ARTERIAL MEASUREMENTS IN CHILDREN AND ADOLESCENTS: RESULTS OF THE KIDCOREBP STUDY

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Objective: This study investigated the accuracy of two oscillometric devices for measuring brachial and central blood pressures (BP) in children and adolescents, using high fidelity intra-arterial measurements as a gold-standard reference.

Methods: 57 children and adolescents aged 9.5 ± 4.6 years (mean ± SD, range 3 to 17, 74% < 13 years) without aortic obstruction were recruited. A catheter was inserted into the ascending aorta via the femoral artery during a clinically-indicated procedure. Aortic BP was measured with a Verrata wire (Philips Volcano), along with brachial BP via two oscillometric devices: SphygmoCor XCEL (AtCor Medical, N = 51) and/or Mobil-o-Graph (MoG, IEMGmbH, N = 40). Intra-arterial brachial systolic BP was derived by calibrating the brachial pulse waveform (measured via tonometry after wire