POSTER SESSION

POSTERS’ SESSION P09:

LARGE ARTERIES/MICROCIRCULATION

PREDICTORS FOR PROGRESSIONS OF BRACHIAL–ANKLE PULSE WAVE VELOCITY AND CAROTID INTIMA-MEDIA THICKNESS OVER A 12-YEAR FOLLOW-UP: HANZHONG ADOLESCENT HYPERTENSION STUDY

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Objective: Atherosclerotic diseases are the leading cause of death worldwide. This study aimed to investigate the predictors of brachial-ankle pulse wave velocity (baPWV) and carotid intima-media thickness (CIMT) progression in a Chinese cohort over a 12-year follow-up period and to determine whether these predictors differ by follow-up time.

Design and method: A total of 202 participants were recruited from a previously established cohort in Shaanxi Province, China. Both baPWV and CIMT were measured in 2013 and 2017. Multivariable regression was used to determine the predictors of CIMT and baPWV progression.

Results: Men had higher CIMT and baPWV and a higher rate of CIMT progression during two follow-ups than women. A 4-year change in systolic blood pressure (SBP) was associated with baPWV progression, while a 12-year change in diastolic blood pressure (DBP) was associated with baPWV progression. The increased progression of baPWV presented a linear trend when subgrouping all the subjects according to SBP and DBP changes over 4 years and 12 years, respectively. To further explore the relationship between SBP and baPWV, and its progressions, we divided all the participants into four groups according to the levels of baPWV and SBP in 2013. baPWV progression was significantly increased in subjects with normal baPWV and high SBP when compared with those with high baPWV and normal SBP (171.7 ± 65.3 vs. -157.0 ± 49.7). In addition, heart rate change over 4 years and 12 years was consistently associated with CIMT progression, and a linear trend was also seen when subgrouping the population into three groups: large decrease, moderate change and large increase, based on BP change from baseline to the follow-up in 2013 and 2017.

Conclusions: Our study demonstrated that SBP and DBP contributed differently in different stages to the progression of arterial stiffness in this Chinese cohort. Moreover, heart rate was consistently involved in the increased progression of CIMT in all periods. These findings underline the importance of early detection and control of blood pressure and resting heart rate for the prevention of arterial stiffness progression.

THE ROLE OF BIOMARKERS IN THE ASSESSMENT OF TARGET ORGAN DAMAGE IN HYPERTENSION

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Objective: Hypertension is associated with several circulatory biomarkers and target organ damage (TOD). The present study sought to investigate the possible link between circulatory biomarkers with markers of TOD in hypertensives.

Design and method: We enrolled 896 consecutive essential hypertensives (mean age 53 ± 12 years, 472 males). Markers of TOD [left ventricular mass index (LVMi), pulse wave velocity (PWV), estimated glomerular filtration rate (eGFR), ankle-brachial index (ABI), and microalbuminuria] were evaluated in all patients. LVMi was assessed echocardiographically using the Devereux formula. eGFR was estimated using the MDRD formula. Microalbuminuria was measured with the albumin-creatinine ratio. Organ damage was defined as described in the 2018 European Hypertension Guidelines. Circulatory biomarkers were assessed by measurement of high-sensitivity C-reactive protein (hsCRP), serum amyloid A (SAA), glycated hemoglobin (HbA1c) and thyroid-stimulating hormone (TSH) in blood samples.

Results: In multivariable regression analysis, hsCRP exhibited a significant association with LVMi (p = 0.018), PWV (p < 0.001), eGFR (p = 0.006) and urine microalbumin (p < 0.001), which was independent of relevant confounders. In identical analysis, associations were observed for SAA with PWV (p < 0.001), urine microalbumin (p < 0.001), LVMi (p < 0.001), eGFR (p = 0.008) and for HbA1c with LVMi (p = 0.001), ABI (p = 0.046), PWV (p < 0.001). No associations were observed between TSH and TOD. In further analysis, receiver operating characteristic (ROC) curves were generated to evaluate the ability of hsCRP, SAA and HbA1c to discriminate subjects with extended TOD. The area under the curve (AUC) and 95% CIs of the ROC curves for concurrent TOD in 4 or more organs were AUC = 0.71 (95% CI: 0.64–0.78, p < 0.001) for SAA, AUC = 0.68 (95% CI: 0.61–0.75, P < 0.001) for HbA1c and AUC = 0.65 (95% CI: 0.57–0.74, p < 0.001) for hsCRP, respectively.

Conclusions: Our findings support the close link between circulatory biomarkers and TOD in hypertension, as well as, the predictive ability of hsCRP, SAA and HbA1c levels for TOD. However, the exact role of these biomarkers in the development of TOD in hypertension warrants further investigation.

AORTIC PULSE WAVE VELOCITY AS A POTENTIALLY USEFUL DIAGNOSTIC TOOL FOR SUSPECTED NEW HYPERTENSION IN ADULTS – PRELIMINARY RESULTS

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Objective: Aortic pulse wave velocity (PWV) is a well-established marker of arterial stiffness (AS) and is an independent predictor of cardiovascular risk. However, to which extent this hemodynamic parameter could be used for the diagnosis of systemic arterial hypertension (AH) has not been consistently addressed, and this was the objective of our study.

Design and method: A cross-sectional study including 54 consecutive apparently healthy adults, with elevated office blood pressure (BP) (new AH), free of any chronic medication or relevant clinical condition. Carotid-femoral PWV was measured to all participants with the Complior SP device, complying with the methodological recommendations, and 24 h ambulatory blood pressure monitoring (ABPM) was used to confirm the presence of AH. All participants were evaluated by the same experienced clinician.

Results: The 54 participants had a mean age of 46 ± 11 years, was predominantly male (n = 48; 89%), with a mean body mass index of 27 ± 4 Kg/m2, mean office BP was 163 ± 13 mmHg for systolic BP and 95 ± 9 mmHg for diastolic BP, and mean heart rate of 75 ± 12 bpm. Mean total cholesterol was 184 ± 35 mg/dL, HDL cholesterol was 53 ± 11 mg/dL, and glycaemia was 86 ± 11 mg/dL. PWV was significantly correlated with age, BP and potassium levels. Abnormal ABPM was identified in 44 participants (86%). The predictive capacity of PWV for the diagnosis of new HT was checked in a ROC-curve analysis (figure), from which an AUC of 0.76 (IC: 0.61–0.92; p = .02) was observed. A cut-off of 9.5 m/s had a sensitivity of 94%, with a positive predictive value of 90% for an abnormal ABPM and confirmation of HT.

Conclusions: This study provides promising preliminary results on the potential use of PWV for clinical decision-making concerning the diagnosis of new AH in...
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Objective: To investigate arterial stiffness markers in the middle-aged naïve patients with grade 1–2 essential arterial hypertension (EAH) and to compare effects of valsartan/amlodipine (V/A) and perindopril/indapamide (P/I) single-pill combinations (SPC) on these parameters.

Design and method: Retrospective, controlled, open-label study. At the first phase of the study according to medical records data a group of naïve patients 40–65 years old with grade 1–2 EAH (n = 100, mean age 51.9 ± 6.5 years) and a group of healthy controls (n = 86, mean age 48.8 ± 5.8 years) was retrospectively formed. The analysis of arterial stiffness was carried out by the volumetric sphygmonography using Vasera VS-1500N device (Fukuda Denso Co., Ltd, Japan) and cardio-ankle vascular index (CAVI), ankle-brachial index (ABI) and augmentation index (AI) were calculated. At the second phase of the study, hypertensive patients were divided into two groups according to the age 49 ± 7.0 years. The first one (n = 38, mean age 52.9 ± 6.0 years) was treated with V/A SPC, and the second one (n = 52, mean age 52.9 ± 6.0 years) was treated with P/I SPC. In all included patients arterial stiffness and blood pressure data were available at baseline and after 12 weeks of follow-up.

Results: In hypertensive patients CAVI, on the left- (7.9 ± 1.3) and right side (8.1 ± 1.3), as well as the right-side AI (1.22 ± 0.31%) were significantly higher (respectively, p = 0.006, p = 0.003, p = 0.047) compared to the controls (respectively, 7.5 ± 0.9, 7.6 ± 0.9, 1.13 ± 0.28%). At the end of follow-up, in the V/A SPC group right-CAVI value significantly decreased from 8.20 ± 1.20 to 7.58 ± 1.44, p = 0.001, left-CAVI value (from 8.13 ± 1.40 to 7.46 ± 1.43, p < 0.001) and right-ABI value (from 1.04 ± 0.10 to 1.00 ± 0.11, p = 0.015). No significant differences in the changes of arterial stiffness parameters have been found between the two treatment groups.

Conclusions: In untreated 40–65 years-old patients with grade 1–2 EAH arterial stiffness assessed by volumetric sphygmonography is significantly higher compared to healthy individuals. 12-week therapy with V/A or P/I SPCs improves elastic properties of the major arteries.

PERIPHERAL AND CENTRAL ARTERIAL PARAMETERS, BONE DENSITY AND FRACTURES: ANALYSIS OF CARTAGENE

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Objective: Several studies have reported an association between hypertension and fracture incidence. Nevertheless, whether peripheral and central arterial parameters are associated with bone density and fracture incidence has not been studied. Furthermore, whether these associations are influenced by antihypertensive usage is unknown.

Design and method: Prospective analysis of CARTAGENE, a cohort of individuals between 40 and 69 years old from Quebec (Canada) recruited between 2009 and 2010 (n = 20,007). Individuals with available bone density and arterial parameters are included. Peripheral blood pressure is measured using an Omron HEM-907XL sphygmomanometer and central arterial parameters using a Sphygmocor SCOR-Pax. Bone density at baseline is measured using calcaneal quantitative ultrasound and incidence of fracture is identified through administrative databases from recruitment to 2016 using previously validated algorithms. Linear and Cox regression models adjusted for demographics, comorbidities and medication are used to evaluate the association between arterial parameters, bone density and fracture. The effect of antihypertensive drugs is assessed using interaction terms.

Results: We included 17,118 individuals (52% women, mean age 54 years, 22% using antihypertensive medication). Mean peripheral arterial pressure is 124/74 mmHg. 721 individuals had a fracture during a median follow-up of 6.6 years. After adjustment, increases in systolic and diastolic peripheral pressures were associated with decreased bone density in individuals without antihypertensive usage while these parameters had