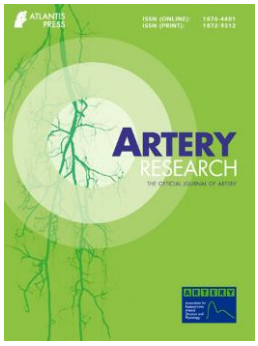

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P1.12: B-PROOF: IS ARTERIAL STIFFENING ASSOCIATED WITH HOMOCYSTEINE?

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P1.08
THE ROLE OF PULSE PRESSURE FOR COGNITIVE DECLINE IN HYPERTENSION

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Objective: Pulse pressure (PP), as a marker of large artery stiffness, is a risk factor for target organ damage in hypertension (HT). We hypothesized that elevated PP, as a marker of enhanced arterial stiffness, may be correlated with specific early target organ damage (TOD) of the brain - mild cognitive impairment (MCI).
Design and methods: 148 treated HT patients (Pts) - males 51 (34.5%), females 97 (65.5%) with mean age 64.16±11.18 years and mean hypertension history 13.1±11.05 years were included. Full medical history, esp. HT history, physical examination and laboratory screening were gathered. Only Pts in sinus rhythm were included. We screened the Pts for MCI with a battery of neuropsychological tests (NPTs): Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA). Ambulatory Blood Pressure Monitoring was conducted: mean day PP was 56.85±12.02 mmHg and mean night PP - 55.15±16.13 mmHg.
Results: Regression analysis found correlation between day and night PP and NPTs' results. With Mann-Whitney Test ($\alpha<0.05$) we found that there is a significant difference (sig. 0.023 for MMSE) in the mean values of the NPTs' results between the groups with PP>50 and PP≤50 mmHg. Again with Mann-Whitney Test we assessed the significance of the difference between mean values of day-PP (sig. 0.01) and night-PP (sig. 0.02) between Pts with MCI and those without (resp.>55 and <55 mmHg).
Conclusion: Elevated PP in treated HT is a risk factor for MCI. We should screen Pts with HT for specific TOD - MCI.

P1.09
RELATION OF CENTRAL AND BRACHIAL BLOOD PRESSURE TO ECG LEFT VENTRICULAR HYPERTROPHY. THE CZECH POST-MONICA STUDY

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Objective: Central blood pressure (BP) has been shown to be a better predictor of target organ damage and cardiovascular events than brachial BP. Whether central BP is a better predictor of left ventricular hypertrophy (LVH) determined by electrocardiography is not known.
Methods: Radial applanation tonometry and ECG were performed in 728 subjects from the Czech post-MONICA study (a randomly selected 1% population sample). LVH was determined using the Sokolow-Lyon index and Cornell product; central pressure was derived from radial pulse.
Results: Of 657 subjects included in the analysis, 17 (9.4%) below 45 years and 43 (9%) over 45 years had LVH. In multiple linear regression analysis, the Sokolow-Lyon index in younger individuals was only associated with male sex and low BMI, with no association with BP found. In older individuals, LVH was associated with higher central and brachial BP. In separate binary logistic regression analyses adjusted for covariates, the odds ratios for central systolic pressure was higher than those for brachial systolic and pulse pressure in LVH prediction.
Conclusion: Noninvasively determined central pressure in subjects over 45 years is more strongly related to ECG LVH than brachial pressure. This further supports a closer association of central pressure with target organ damage. Neither central nor brachial blood pressure is associated with Sokolow-Lyon voltage criteria in younger individuals.

P1.10
PREVALENCE OF RESISTANT HYPERTENSION IN A GENERAL POPULATION IN NORTHERN ITALY: ASSOCIATED CARDIOVASCULAR RISK FACTORS AND TARGET ORGAN DAMAGE

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Background: Resistant hypertension (RH) is defined by most guidelines as blood pressure that remains above goal despite use of at least 3 antihypertensive agents of different classes, including a diuretic, prescribed at optimal doses. Few data are available on the clinical characteristics and on the prevalence of different forms of organ damage in these patients. Aim of the study was to evaluate the prevalence of RH and the presence of associated cardiovascular (CV) risk factors and target organ damage (TOD) in a group of hypertensive patients selected from a general population sample in Northern Italy (Vobarno Study). Methods: 478 subjects (mean age 58±3 yrs, 44% males, 66% hypertensives) underwent laboratory examinations and both clinic and 24 hours BP measurement (Spacelabs 90207). Left ventricular (LV) and carotid artery structure were assessed by ultrasound and carotid-femoral PWV was measured using Complior SP (Artech, Pantin, France). Results: among treated hypertensive patients 9.5% were defined as resistant. Patients with RH were older (mean age 69±4 vs 60±9 yrs, p<0.01), had higher glucose values (115±47 vs 103±24 mg/dl, p<0.05) and were more often of female gender (female 73% vs male 27%, p<0.05); no difference in BMI and lipid levels was observed. Estimated glomerular filtration rate (MDRD) was lower in RH (72±17 mL/min/1,73 m2 vs 82±16, p<0.01). Patients with RH had greater LV mass index (47.7±10.5 vs 40.7±10.0 gr/m2.7, p <0.001), LV relative wall thickness (0.42±0.08 vs 0.38±0.05 p <0.001), intima media thickness (Meanmax 1.47±0.42 vs 1.18±0.30 mm, p =0.01) and PWV (13.3±2.8 vs 11.8±2.8 m/sec, p<0.05).
Conclusions: in a group of hypertensive patients selected from a general population in Northern Italy the prevalence of RH was relatively high. Patients with RH were older, had higher glucose values and a higher prevalence of cardiac, vascular and renal organ damage.

P1.11
INCREASED AGE, BODY MASS INDEX AND LOW HDL-C LEVELS RELATE TO AN ECHOLUCENT STRUCTURE OF THE CAROTID INTIMA—MEDIA THICKNESS: THE METEOR STUDY

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Introduction: Echolucent plaques have high lipid contents and are related to a higher cardiovascular risk. Studies relating echolucency to cardiovascular risk in early stages of atherosclerosis are limited. We studied the relation between cardiovascular risk factors and the echolucency of the carotid intima—media thickness (CIMT) in low-risk individuals.
Methods: Data were used from the METEOR (Measuring Effects on Intima-Media Thickness: an Evaluation of Rosuvastatin) study. In this post-hoc analysis, duplicate baseline ultrasound images from the far wall of the left and right common carotid arteries were used for evaluation of the echolucency of the CIMT, measured by grey-scale median (GSM), scale: 0-256. Low GSM values reflect echolucent, lipid-rich structures, whereas high values reflect echogenic structures. The relations between GSM and cardiovascular risk factors were evaluated with linear regression models.
Results: Baseline GSM was 83.96 (standard deviation: 29.40). Lower GSM of the CIMT was associated with older age, high body mass index (BMI), and low levels of high-density lipoprotein cholesterol (HDL-C) (beta, 95% confidence interval [CI]: -4.49 [-6.50;-2.49], -4.51 [-6.43;-2.60], and 2.45, [0.47;4.42], respectively). Thickness of the common CIMT was inversely related to GSM of the CIMT (beta -3.94 [-1.98;-5.89]).
Conclusion: Older age, high BMI, and low levels of HDL-C are related to echolucency of the CIMT, reflecting high lipid levels in the arterial wall. Hence, echolucency of the CIMT may be used as marker for cardiovascular risk profile that covers more than thickness alone.

P1.12
B-PROOF: IS ARTERIAL STIFFENING ASSOCIATED WITH HOMOCYSTEINE?

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Introduction: Recently in elderly, homocysteine alone has been shown to be a better predictor of cardiovascular mortality than models based on classical risk factors. The pathophysiological pathway is however still unclear. Current view is that increased thrombogenicity, increased oxidative stress and over-activation of redox-sensitive inflammatory pathways, leads to impaired endothelial function.

Methods: Baseline data of the B-PROOF study are used to determine associations between homocysteine level and outcomes of vascular function. A subgroup was included (n=410, 58% male, age 72.6 ± 5.5 yrs, mean homocysteine level 15.2 ± 3.1 μmol/l). We assessed carotid intima media thickness (cIMT), carotid distensibility, using ultrasonograpy, and pulse wave velocity (PWV) and augmentation index (AIx), measured with applanation tonometry. Furthermore, office blood pressure measurements (n=410) and 24-hour blood ambulatory pressure recordings (n=70) were performed. Associations were tested using linear regression analysis and adjusted for age, gender, mean arterial pressure and heart rate.

Results:

The baseline analysis of the B-PROOF trial showed that log homocysteine was associated with PWV [β 0.010 (95%CI 0.006;0.014)] and with carotid IMT [β 0.0002 (95%CI 0.0001;0.0004)]. However, the association with IMT did not remain significant after adjustment for confounders [β 0.001 (95%CI -0.001;0.003)], but this finding remained for PWV [β 0.006 (95%CI 0.002;0.011)]. No significant association with homocysteine was found for AIx, distensibility or blood pressure levels.

Conclusions:

Homocysteine is possibly associated with arterial stiffness in elderly, measured with PWV. However, a subsequent question is whether lowering of homocysteine levels, indeed improves vascular function. Currently, this trial is still in progress.

P1.13

CENTRAL BLOOD PRESSURE (BP) IS AN INDEPENDENT PREDICTOR OF WORSE OUTCOME IN YOUNG TO MIDDLE AGE SUBJECTS SCREENED FOR STAGE I HYPERTENSION

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Objective: The aim was to evaluate the association of central BP with target organ damage (TOD) and the risk of future hypertension in a cohort of subjects from the HARVEST study. Methods. We studied 305 stage I hypertensive subjects (mean age, 38±10 years). Central BP was obtained from radial artery tonometry. TOD included left ventricular hypertrophy and/or microalbuminuria.

Results: At baseline peripheral BP was 138±12/86±7 mmHg, average 24-hour BP was 130±11/80±8 mmHg, central BP was 125±13/86±8 mmHg. In a multiple logistic regression including ambulatory BP, central mean BP was associated with TOD (p=0.01). In the subjects divided according to whether their central mean BP was above or below the median (98.7 mmHg), during 9-year follow-up, sustained hypertension was developed by 38.8% of subjects with low central mean BP and by 64.5% of subjects with high central mean BP (p<0.001). Central mean BP was used because it was a better predictor of future hypertension (OR 2.5) compared to central SBP or DBP. In a multiple logistic regression central mean BP and not central pulse pressure, was an independent predictor of future hypertension (p=0.004). Also ambulatory systolic (p=0.002) and diastolic (p=0.02) BPs were independent predictors. When all pressures were included in the same model, central mean BP remained a predictor of future hypertension (p=0.004) on top of ambulatory BP.

Conclusion: In young-to-middle-age stage I hypertensive subjects central mean BP, but not pulse pressure, was associated with TOD and central BP was a significant predictor of adverse outcome on top of 24-hour BP.

P1.14

FORMATION OF NEW ATHEROSCLEROTIC PLAQUES IN WELL CONTROLLED RHEUMATOID ARTHRITIS DEPENDS ON CLASSICAL CARDIOVASCULAR RISK FACTORS: A PROSPECTIVE LONGITUDINAL STUDY

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Background: Rheumatoid arthritis (RA) is an independent risk factor for cardiovascular disease (CVD); RA patients demonstrate advanced pre-clinical carotid atherosclerosis compared to controls.

Objectives: To assess: the rate of progression of subclinical atherosclerotic plaque formation in RA patients and the factors leading to progression; whether the rate of progression in these patients is faster than in non-RA subjects carefully-matched for traditional CV risk factors. Methods: Carotid plaques were assessed by ultrasonography at baseline and follow-up end, separated by an average of 3.6±0.2 years, in 64 non-diabetic RA patients (53♀, aged 59.2±12 years) without concomitant CVD (RA disease duration 7.8±6.2 years). 'Healthy' controls matched 1:1 both at baseline and follow-up end for all traditional CVD risk factors with 35 RA patients were also studied.

Results: New plaques formed in 30% of patients who were significantly older, heavier tobacco user and had higher average systolic blood pressure compared to the rest RA population. Lipids, obesity, inflammatory markers and other RA related parameters were comparable between the 2 subgroups. In multivariate analysis: age and smoking predicted new plaque formation of all classical CVD factors (model 1); longer duration of corticosteroid use (low-dose) and shorter duration of biologic agent use (of all RA related parameters/drugs -model 2). In a final model: age, smoking and corticosteroid use predicted new plaque formation. Being in clinical remission on average during 62% of follow-up time, RA patients displayed similar rate of progression atherosclerotic plaque formation to the matched controls.

Conclusions: Formation of new atherosclerotic plaques in patients with well-controlled RA depends mainly on traditional cardiovascular risk factors and corticosteroid use.

P1.15

CENTRAL BLOOD PRESSURE (CBP) MEASUREMENTS IN THE PORTUGUESE POPULATION: THE GUIMARÃES STUDY (STUDY TO DETERMINE THE CARDIOVASCULAR RISK OF THE POPULATION OF GUIMARÃES/VIZELA: PREVALENCE OF ARTERIAL STIFFNESS AND EARLY VASCULAR AGING SYNDROME)

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We observed 1104 subjects of the Portuguese population coming from two northern adjacent cities: Guimarães and Vizela. They were randomly selected to be included in a cohort representative of age and gender distribution. We evaluated their blood pressure (BP) (mean three measurements), height, weight, lipidic profile, fasting glucose, HbA1c, serum creatinine, microalbuminuria (occasional sample) and CBP measurements (Sphygmocor®).

These 1104 subjects (56,4% females), had a mean global age of 47,6 years (18 − 94); 42% had hypertension, 10,7% had Diabetes, 80% had lipidic profile abnormalities, 3,1% had GFR < 60ml/min and 16,1% had microalbuminuria. The mean brachial systolic BP was 131,3 mmHg (84 to 243) and the mean brachial diastolic BP was 76,7 mmHg (44 to 128); The average BMI was 26,8 kg/m2 (16,8 to 46,2).

Mean global CBP (cSBP/cDBP) values recorded were 119/77 mmHg, with a mean Central Pulse Pressure (cPP) of 42 mmHg. Mean CBP values (cSBP/cDBP) recorded by age classes were: 18 to 30 years − 101/71 mmHg (81/50 to136/100), cPP − 30 mmHg; 31 to 40 years − 109/76 mmHg (80/57 to 162/105), cPP − 32 mmHg; 41 to 50 years − 121/82 mmHg (88/54 to 224/131), cPP − 39 mmHg; 51 to 60 years − 125/83 mmHg (90/58 to 163/113), cPP − 43mmHg; 61 to 70 years − 134/79 mmHg (96/55 to 198/112), cPP − 55 mmHg; 71 to 80 years − 137/78 mmHg (91/48 to 202/104), cPP − 59 mmHg; 81 to 90 years − 141/76 mmHg (93/57 to 194/100), cPP − 65 mmHg. These are, to our knowledge, the first CBP measurements performed on a population based cohort in Portugal.

P2 − Endothelium and small arteries 1

P2.01

RELATIONSHIP BETWEEN MEDIA TO LUMEN RATIO OF SUBCUTANEOUS SMALL ARTERIES AND WALL TO LUMEN RATIO OF RETINAL ARTERIOLES EVALUATED NON INVASIVELY BY SCANNING LASER DOPPLER FLOWMETRY

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