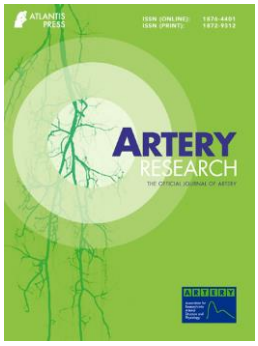

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P10.09: HETEROGENOUS REACTIONS OF FOREARM LARGE ARTERIES AND RESISTANCE VESSELS TO VERAPAMIL TREATMENT

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Patients and methods: 378 elderly hypertensive patients > 60 years (mean age 70.4 ± 6.3 years) treated with at least one antihypertensive agent and presenting with SMC but without dementia were prospectively recruited and underwent a combination of neuropsychological tests, a brain magnetic resonance imaging with semi-quantification of White Matter Hyperintensities (WMH), carotid echotracking, brachial endothelial function and ambulatory blood pressure (BP) assessments.
Results: None of the 3 composite scores (Memory score, verbal fluency, visual memory capacity) was found associated with BP levels. On the other hand, age and gender-adjusted analyses showed a significant and positive association between memory score and calcium channel blockers (CCBs) use (users: +0.14 ± 0.09 versus non-users: -0.12± 0.06, p = 0.016). Multivariate analyses also revealed that CCBs use was significantly associated with a better memory score, independently from age, male gender, WMH and carotid wall cross-sectional area, all of which were associated with worse memory scores.
Conclusions: In elderly hypertensive treated patients with SMC, CCBs use was associated with better memory performances independently of BP level and macro and microvascular alterations, suggesting a specific neuroprotective effect of this pharmacological class. Interventional controlled trials are required to confirm the specific protective effect of CCBs on cognitive decline.

P10.06
RESPONSES OF THE AMBULATORY ARTERIAL STIFFNESS INDEX AND OTHER MEASURES OF ARTERIAL FUNCTION TO ANTIHYPERTENSIVE DRUGS

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Objective: We used antihypertensive drugs as pharmacologic tools to clarify the physiologic meaning of the ambulatory arterial stiffness index (AASI) in comparison to pulse pressures (PP), the arterio-ventricular coupling index (AVCI), and aortic pulse wave velocity (aPWV).
Methods: After a 4-week placebo period, 94 and 107 patients with uncomplicated hypertension were randomly assigned to treatment for one year with atenolol 50 mg/d (AT) or perindopril/indapamide 2/0.6 mg/d (PER/IND). From the individual readings in each patient's 24-hour ambulatory BP recording, we determined 24-hour systolic and diastolic BP. We computed PP as the difference between 24-hour systolic and diastolic BP, AASI as unity minus the regression slope of diastolic on systolic BP, and AVCI as $(T/\tau)/(1+2T/3\tau))$, where T is the heart period in seconds and τ is the decay time of aortic BP during diastole.
Results: Compared to PER/IND, in patients on AT, systolic BP and PP decreased less and AVCI lengthened more ($P \leq 0.009$), whereas the changes in AASI and aPWV did not differ between the two treatment groups ($P \geq 0.25$). In patients with the metabolic syndrome (NCEP-ATPIII criteria), AT and PER/IND lowered systolic BP similarly, but AT lowered diastolic BP more than PER/IND. Conversely, in patients without the metabolic syndrome, PER/IND lowered systolic BP more than AT, but diastolic BP to a similar extent.
Conclusions: On antihypertensive drugs with a different hemodynamic profile, AASI and aPWV behaved similarly. The metabolic syndrome seems to modulate the impact of antihypertensive drugs on systolic BP and PP.

P10.07
PERINDOPRIL THERAPY IMPROVES ENDOTHELIAL FUNCTION AND ARTERIAL STIFFNESS IN HEART FAILURE WITH PRESERVED SYSTOLIC FUNCTION

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Background: Number of heart failure patients with preserved systolic function increases with every year, vascular load is one of the leading determinants in ventriculo-vascular coupling and ventricular function.
Aim: to assess endothelial function by photoplethismografy and arterial stiffness on perindopril therapy in HF patients with preserved systolic function.
Methods: 50 patients with exertional dyspnoe were included in the study, I-II NYHA, EF>45%, ethiology of HF - hypertention, aged 62,3(±8,4), female 56%, BMI 29,9 kg/m^2. Arterial stiffness was measured by applanation tonometry (Sphygmocor): carotid-femoral PWV and MAP, central pulse pressure (PP), aortic augmentation index (AIX); endothelial function was assessed by photoplethismografy using low arm occlusion, clinical status with MQLHF and 6-minutes walk-test (6MWT) at baseline and in 12-months. All patients were on perindopril therapy, start dose 4mg, mean dose 8 mg.
Results: 12-months therapy resulted in improvement of endothelial function, decreasing of arterial stiffness, clinical improvement. PWV decreased from 10 (8,6;11,9) to 8,8(8,1;11) (p=0,05); endothelial function improved from 1,25[1,09;1,52] to 1,42[1,2;1,64] (p<0,05), parameters of central hemodynamics changed: MAP from 105,5 (97,5;115,5) to 102(97;106) mmHg; CSBP from 145(132;152) to 130(122;138)mmHg; CDBP from 85 (79;93) to 80 (79;87)mmHg; AIX from 29,5[24,5;34,5] to 28[22;32] . Clinical status: NYHA FC from 2(1;2) to 1(1;1), MQLHF from 39,5(27;47) to 32 (24;39), 6MWT from 390(375;420) to 460(450;470).
Conclusions: 12-months perindopril therapy improved endothelial function, led to reduction of arterial stiffness and resulted in improvement of clinical status of diastolic HF patients, that suggests that perindopril should be considered therapeutically usefull in diastolic HF treatment.

P10.08
THE BRACHIAL ARTERY ENDOTHELIAL FUNCTION UNDER THE INFLUENCE OF VASOACTIVE ANTIHYPERTENSIVE TREATMENT

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Objective: To investigate and compare the endothelium-dependent vasorelaxation dynamics when administering beta—blockers carvedilol, nebivolol and calcium antagonist amlodipine to patients with essential arterial hypertension (AH)
Methods: Ninety patients with 1-2 grades AH aged 30-55 years were studied. All patients were randomized to receive carvedilol (n=45), nebivolol (n=25) and amlodipine (n=25) in initial daily doses of 25, 5 and 5 mg respectively. In two weeks if office BP level of 140/90 mmHg was not attained the dose of medicine was doubled. In four weeks in cases of uncontrolled AH the indapamide 1.5 mg was added. The length of administering period was 8 weeks. Endothelial function (EF) was evaluated with the help of flow mediated dilation (FMD) test. The ambulatory BP monitoring (ABPM) was held.
Results: An average daily dose of carvedilol, nebivolol and amlodipine amounted to 31.4±16.2, 5.7±2.4 and 6.4±2.6 mg. Mean 24-h systolic and diastolic BP significantly decreased in all groups. We also observed that the degree of brachial artery FMD reliably increased by +5.5%, +1.6% and +4.6% under the influence of carvedilol, nebivolol and amlodipine respectively. At the same time the share of patients with full recovering of EF (brachial artery FMD >10%) increased significantly only in carvedilol group — from 4.5% to 27.3% ($p\chi^2=0.004$).
Conclusion: In hypertensive patients the brachial artery endothelial function significantly increased under the influence of vasoactive antihypertensive drugs carvedilol, nebivolol and amlodipine. The greatest effect on brachial artery flow mediated dilation was observed in carvedilol group.

P10.09
HETEROGENOUS REACTIONS OF FOREARM LARGE ARTERIES AND RESISTANCE VESSELS TO VERAPAMIL TREATMENT

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Objective: Calcium channel blockers posseses vasodilating action but there is no evidence to our knowledge about vasodilating effect on different arterial vesels. The aim of this investigation was to ascertain the reactions of large arteries and precapillary resistance vessels during treatment with sustained-released Verapamil (Flamon-240 SR, Mepha Ltd).
Design and methods: 30 essential hypertensives (WHO II) aged between 40-65 yrs received 2 months' treatment with Flamon-240 SR 1-2 tablets daily. Blood pressure was determined auscultatory. Cardiac output (CO) and systemic vascular resistance (SVR) were derived from

echocardiographic findings. Distensibility (D) of forearm large arteries was calculated as a ratio between volume pulse amplitude and pulse pressure. Forearm vascular resistance (FVR) was calculated from data on mean arterial pressure and forearm blood flow measured by venous occlusion plethysmography.
Results: It was stated that Verapamil significantly reduces systolic (-18,8±1,9 mmHg), diastolic (-8,7±1,2 mmHg), mean (-13,7±1,6 mmHg) and pulse (-12,5±1,5 mmHg) pressure. D of forearm large arteries in all investigated patients increases by 53±4%, whereas FVR did not change uniformly. In the case when hypotensive effect was caused by a decrease in CO, FVR did not change, but in the case when hypotensive effect was ensured by a decrease in SVR, the inverse relationship existed between changes in SVR and FVR (r = -0,6).
Conclusions: During effective treatment of essential hypertensives with Verapamil contractile activity of forearm large arteries always decreases, whereas precapillary vessels obviously are involved in counterregulation and this masks direct vasodilator effect of Verapamil on arterial smooth muscles.

P10.10
EFFECT OF THE TREATMENT OF RHEUMATOID ARTHRITIS WITH ANTI-TNF-A INFLIXIMAB ON ARTERIAL WALL STIFFNESS PARAMETERS

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Background: Rheumatoid arthritis (RA) is a chronic inflammatory, autoimmune disease, which may lead to arterial dysfunction. Treatment with anti-TNF-α infliximab can influence not only inflammation, disease activity, but can also greatly impact arterial wall function.
Aim of the study was to assess whether aortic augmentation index (AIx) and regional carotid-radial pulse wave velocity (PWV) were altered in RA patients treated with infliximab.
Methods: We examined 75 RA patients (age 42.03±10.69 years) with high disease activity (DAS28 5.40±0.93), 16 of them were treated with infliximab. AIx and PWV were assessed non-invasively by applanation tonometry (Sphygmocor v.7.01, AtCor Medical).
Results: By multiple regression analysis we have found that carotid-radial PWV depends only on mean blood pressure (MBP) and infliximab therapy. To test the influence of infliximab on arterial wall parameters, binary variable indicating the intake of infliximab was added to the list of independent predictors. The same forward analysis was applied after that. It has been established that infliximab reduced the values of PWV as compare with patients not treated with infliximab (7.69±0.69 vs. 8.61±1.02; p=0.001). However, no similar trend was observed for AIx (18.38±12.48 vs. 24.56±11.44; p=0.094). The estimated regression coefficient have implied that given fixed MBP, the mean PWV can be reduced approximately to 0.886 m/s in patients treated with infliximab.
Conclusions: The treatment with anti-TNF-α infliximab can influence the conduit arteries. Carotid-radial PWV may serve as a good marker to decide upon infliximab.

Pathophysiology 5

P11.01
AMBULATORY ARTERIAL STIFFNESS INDEX (AASI) IS CORRELATED TO EA/EMAX, NOT PULSE WAVE VELOCITY IN PATIENTS WITH RESISTANT HYPERTENSION (RH) AND TYPE-II-DIABETES MELLITUS

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Objective: To examine if AASI is correlated to arterial stiffness in patients with RH and type-II-diabetes mellitus.

Characteristic	Controlled hypertension	Resistant hypertension	P	Adjusted P
Sex (male/female)	15/9	27/7		
Age (years)	62±10	64±9	0.49	
Body mass index (kg/m^2)	34±7	35±5	0.31	0.21
Length of disease (years)	10.4±6.3	14±7	0.02	0.02
Pulse pressure (mmHg)	50±8	66±9	<0.0001	<0.0001
Mean arterial pressure (mmHg)	88±4	96±7	<0.0001	<0.0001
Ambulatory arterial stiffness index	0.55±0.14	0.57±0.13	0.564	0.56
Heart rate (bpm)	74±11	71±13	0.312	0.24
Pulse wave velocity (m/s)	9.7±3	12.1±5	0.042	0.39
Characteristic impedance	0.07±0.03	0.1±0.1	0.031	0.05
E_A(mmHg/ml)	1.63±0.5	1.86±0.6	0.12	0.06
E_{MAX}(mmHg/ml)	2.7±1	2.1±0.9	0.023	0.08
E_A/E_{MAX}	0.7±0.3	1.1±0.5	0.003	0.005
Ejection fraction (%)	55±10	45±11	<0.0001	0.001

Ambulatory arterial stiffness index (AASI) is correlated to E_A/E_{MAX}, not pulse wave velocity in patients with resistant hypertension (RH) and type- II-diabetes mellitus P 11.01

Methods: We included 87 patients. RH was defined according to guidelines from the American Heart Association.
Echocardiography was performed using GE Vivid 7and pulse wave analysis using Sphygmocor. All examinations were performed under standardized conditions. All analyses were done blinded offline using Echopac and customized software.
Ambulatory blood pressure (BP) measurement was done using Kivex TM 2430 and Spacelab 90217. All parameters were adjusted for sex, age, length of disease and heart rate using multiple linear regression. Spearman's rank correlation was used to estimate correlation between groups.
Results: 34 patients had RH and 24 had controlled hypertension (CH) leaving 29 with uncontrolled hypertension. See table 1 for patient characteristics. Patients were comparable with regards to age and body mass index. AASI did not differ significantly between groups. Pulse pressure, mean arterial pressure and length of disease varied significantly between groups. AASI and PWV was not correlated (Spearman's rho = 0.08 , P = 0.57).Neither was AASI and characteristic impedance (Spearman's rho = 0.1, P=0.44) However when comparing AASI and E_A/E_{MAX} we found positive correlation (Spearman's rho 0.36 , P=0.006) and when comparing AASI and ejection fraction (Spearman's rho = -0.29 , P = 0.02) negative correlation.
Conclusion: AASI is not correlated to PWV or characteristic impedance, which are measures of arterial stiffness, but to E_A/E_{MAX} and ejection fraction, which might suggest that AASI does not reflect arterial stiffness, but ventriculo-vascular coupling.

P11.02
BRAIN WHITE MATTER LESIONS AND ARTERIAL WALL PARAMETERS IN MIGRAINE PATIENTS

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Background: Migraine is a benign neurological disease, however, some migraineurs develop asymptomatic lesions in the deep white matter (DWMLs) whose origins still need to be clarified.
Objective: To evaluate relationship between DWMLs and traditional cardiovascular risk factors, arterial wall parameters (carotid intima-media thickness, distensibility and stiffness (CS), augmentation index (AIx) and aortic pulse wave velocity) and right-to-left shunts (RLS) in migraine patients.
Methods: 114 active migraineurs (mean age 35.9±9.6 years, 22 (19.3%) males, 50 (43.9%) with aura) participated in the study. Magnetic resonance imaging was performed with a 1.5-T scanner. DWMLs load was assessed