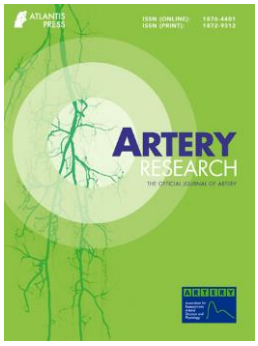

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P7.7: GENDER-RELATED TRENDS IN 24-HOUR AMBULATORY BRACHIAL BLOOD PRESSURE AND CENTRAL PULSE WAVE MONITORING

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to monitor response to therapy as well as pharmacologic support of the circulation.

P7.3
IMPACT OF KIDNEY TRANSPLANTATION ON AORTIC STIFFNESS: RESULTS FROM 2-YEAR FOLLOW-UP

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Objectives: Kidney transplantation (KTx) may improve arterial stiffness. The purpose of the present study is to examine the effects of KTx on aortic stiffness after 2 years of follow-up.
Method: In this prospective, longitudinal observational study, we studied hemodynamic parameters prior to KTx and 3, 6 and 24 months after a KTx in 59 dialysis patients. Aortic stiffness was measured by carotid-femoral pulse wave velocity (cf-PWV) and heart rate adjusted central augmentation index (AIx) was measured by arterial tonometry. A successful KTx was defined by an estimated eGFR of $\geq$45 mL/min/1.73m2. Linear mixed model was used to take into account the repeated measures of aortic stiffness and mean blood pressure. Values are reported as mean$\pm$SEM
Results: The mean age was 48 years, with 70% male, 20% with cardiovascular disease and 25% diabetes. After adjusting for mean blood pressure, cf-PWV decreased significantly from 11.2$\pm$0.33 to 10.3$\pm$0.30 by 3 months (P=0.042), but cf-PWV gradually increased to 10.8$\pm$0.31 and 11.2$\pm$0.33 (m/s) by 6 and 24 months and was not statistically different from the baseline. In an analysis stratified by age, the early improvement of aortic stiffness was only statistically significant for patients older than 50 years of age. However, MBP-adjusted AIx did not change significantly after KTx.
Conclusion: This study shows that there is an early reduction in aortic stiffness after KTx with a gradual return in aortic stiffness to baseline values after 2 years of follow-up. This study suggests a reduction in the rate of progression of aortic stiffness after KTx.

P7.4
AORTIC STIFFNESS IS ASSOCIATED WITH FUNCTIONAL LIMITATION (OR SIX MINUTE WALK DISTANCE) IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE: THE ERICA STUDY

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Background: Six-minute walk distance (6MWD) independently predicts mortality and hospitalisation in Chronic Obstructive Pulmonary Disease (COPD) and is significantly reduced in COPD subjects with comorbidities of heart disease and hypertension. It also predicts cardiovascular events in stable coronary heart disease, and mortality in heart failure. We hypothesised that aortic stiffness is associated with 6MWD in COPD patients.
Methods: Interim analysis was performed on 354 stable subjects with COPD recruited to the ERICA (Evaluation of the role of inflammation in non-pulmonary manifestations of airways disease) study. Central haemodynamic measurements included aortic pulse wave velocity (aPWV) and augmentation index (AIx). Other measurements included carotid intima thickness, spirometry, 6MWD, fibrinogen and high-sensitivity C reactive protein (Hs-CRP).
Results: 210 out of 354 subjects (59%) were male, median (range) age 67 (43-84) years, 68% were former smokers. Mean aPWV was 10.2 (2.6) m/s. Linear regression analysis indicated a significant negative association between aPWV and 6MWD ($p<0.001$). This relationship was maintained after adjustment for airflow limitation (Forced Expiratory Lung Volume in 1 second [FEV_1]), age, sex, MAP and supine HR, p=0.011. A 1m/s increase in PWV was associated with a 9 m decrease in 6MWD (95% CI: 4-14 m, p=0.001).
Conclusions: Aortic stiffness is associated with 6MWD in COPD, suggesting a link between vascular ageing and functional limitation in this patient group, which merits further investigation. Reduced 6MWD in COPD subjects with cardiovascular comorbidity, suggests aortic stiffness may be involved in the increased prevalence of cardiovascular events seen in COPD.

P7.5
PHENOTYPING OF ARTERIAL HYPERTENSION BY PULSE WAVE VELOCITY AND PLASMA RENIN ACTIVITY MEASUREMENT

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Objective: To test K.Kario hypothesis (J Am S Hypertens 2010; 4(5):215-218) that predominant "arterial stiffness" (AS) and "volume-dependent" (V) types of arterial hypertension may exist and thus evaluation of arterial stiffness and volume-dependency status may help to choice between a calcium channel blocker (as "anti-stiffness" drug) and a diuretic (as "anti-volume" drug) to achieve blood pressure (BP) control.
Methods: Pulse wave velocity (PWV, SphygmoCor, AtCor, Australia) and plasma renin activity (PRA, radioimmune assay) were measured in 124 (48 men) untreated hypertensive patients aged 50-65 years (mean 59,6$\pm$5,1 years) with GFR CKD-EPI >60 ml/min/1,73 m2. AS-typing was done by individual PWV interpretation (Boutouyrie P., Vermeersch S.J. Eur Heart J 2010;31:2338-2350). PRA <0,65 ng/ml/h was considered as V-type, PRA >0,65 ng/ml/h - as renin (R) type.
Results: V-type was found in 57,3%, R-type in 42,7%, AS-type in 47,6% patients. Isolated (normal PWV) types were observed in 52,4%, isolated R-type was more prevalent (38,7%) than isolated V-type (13,7%). AS+V-type was found in 43,6%, AS+R-type - in 4,0%. It means that 76,1% of patients with V-type had elevated PWV and 91,5% of patients with increased AS are volume-dependent. Multifactor analysis failed to reveal independent predictors of isolated or mixed types, but independent correlation between PRA and PWV (β=-0,45, $p<0,001$) and pulse pressure amplification (β=0,76, $p<0,001$) was found.
Conclusion: Significant over-lap in "arterial stiffness" and "volume" types of arterial hypertension agues against possibility of differential choice between a calcium channel blocker and a diuretic for BP lowering guided by evaluation of PWV and PRA

P7.6
AGE-RELATED TRENDS IN 24-PATTERNS OF AORTIC PULSE WAVE PARAMETERS

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Aim: 24-h ambulatory monitoring (AM) of central blood pressure (BP) and augmentation index (AIx) is a new method that extends understanding of the characteristics of BP and arterial properties. The aim of the study was to explore characteristics of central pulse wave and AIx on AM of brachial and central BP in age subgroups.
Methods: Successful AM of brachial and central BP was done with oscillometric BPLab VASOTENS system (OOO Petr Telegin, Russia) in 84 untreated hypertensive subjects (55,8$\pm$9,6 years, male 36,9%). Gender differences of central BP and AIx were evaluated in patients <55 years (14 men, 23 women), 55-60 years (7 men, 16 women), 61-70 years (10 men, 14 women). Differences were considered significant if $p<0,05$.
Results: Brachial day/night SBP was similar in age subgroups: <55 years 140$\pm$15/130$\pm$18, 55-60 years 139$\pm$17/136$\pm$22, 61-70 years 137$\pm$19/132$\pm$23 mmHg. Increase in day- and night-time brachial PP was observed from younger to older patients due to the reduction of diastolic DBP: <55 years brachial PP day/night 53$\pm$12/52$\pm$12, 55-60 years 57$\pm$11/57$\pm$13, 61-70 years 57$\pm$12/58$\pm$16 mmHg, <55 years DBP day/night 87$\pm$11/78$\pm$11, 55-60 years 84$\pm$9/79$\pm$12, 61-70 years 81$\pm$9/73$\pm$12 mmHg. Aortic day/night PP trend was similar: <55 years 42$\pm$9/43$\pm$10, 55-60 years 45$\pm$10/48$\pm$12, 61-70 years 47$\pm$12/50$\pm$14 mmHg. AIx@HR75 also increased with age, and this increase was observed both during day- and night-time: <55 years AIx day/night 24$\pm$18/31$\pm$17, 55-60 years 28$\pm$16/38$\pm$16, 61-70 years 33$\pm$15/42$\pm$12%.
Conclusion: 24-h AM of central BP revealed age-related increase in aortic PP and AIx both for day- and night-time

P7.7
GENDER-RELATED TRENDS IN 24-HOUR AMBULATORY BRACHIAL BLOOD PRESSURE AND CENTRAL PULSE WAVE MONITORING

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(AIx) is a new method that extends understanding of the characteristics of BP and arterial properties. The aim of the study was to explore gender differences on AM of central BP and AIx in different age groups.

Methods: Successful AM of brachial and central BP was done with oscillometric BPLab VASOTENS system (OOO Petr Telegin, Russia) in 84 untreated hypertensive subjects (55,8±9,6 years, male 36,9 %). Gender differences of central BP and AIx were evaluated in patients <55 (14 men, 23 women), 55-60 (7 men, 16 women), 61-70 years (10 men, 14 women). Differences were considered significant if $p<0,05$.
Results: Several findings were consistent among all age groups. First, men had slightly higher levels of brachial and aortic SBP than women: respectively, <55 years brachial SBP day/night 144±14/134±20 vs 137±16/128±16, 55-60 years 147±18/146±21 vs 139±16/132±22, 61-70 years 141±23/135±32 vs 137±14/129±17 mmHg. Second, nocturnal decline of brachial and aortic SBP was greater in women than in men: respectively, <55 years aortic SBP day/night 128±15/121±15 vs 132±14/132±14, 55-60 years 130±15/124±21 vs 134±17/137±19, 61-70 years 128±14/122±16 vs 131±22/127±29 mmHg. Third, women had a higher AIx@HR75 in all time periods but night increase AIx was significantly more evident in men: respectively, AIx (day-night)/day (%) <55 years -44±12 in men vs -22±7,0 in women, 55-60 years -38±18 vs -20±16, respectively, 61-70 years -45±19 vs -19±10, respectively ($p<0,05$ for all ages).
Conclusion: Gender differences in characteristics of AIx and its diurnal variation were identified and should be considered when analyzing the results of AM of central BP

P7.8
SYSTOLIC PRESSURE AMPLIFICATION IN CHILDREN

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Objective: The aim of our study was to measure systolic pressure wave amplification (brachial minus central systolic blood pressure) in children and to assess anthropometric measures correlated with amplification in children with and without chronic kidney disease (CKD).
Design and Methods: In a prospective single centre study 150 children (103 with non-dialysis CKD, 23 with hypertension) aged 12.9 ± 2.9 years (81 boys) were recruited from the paediatric nephrology and hypertension out-patient clinics at the Evelina London Children's Hospital. Peripheral blood pressure was measured manually, in triplicate, by aneroid sphygmomanometer. Central blood pressure and carotid-femoral pulse wave velocity (cfPWV) were measured in triplicate using the SphygmoCor system. Renal function was determined by estimated GFR (eGFR) using the Schwartz formula.
Results: Mean amplification (mean ± SD) was 18.8 ± 6.4 mmHg. Systolic pressure amplification was significantly different across age groups of children 5-10 years (16.3 ± 4.8 mmHg), 10-15 years (18.2 ± 5.2 mmHg) and 15-18 years (21.0 ± 7.3 mmHg) ($p = 0.003$). In univariate analysis amplification was correlated with age, height, weight, BMI, and eGFR. It was not correlated with gender, ethnicity or cfPWV. In multivariate linear regression analysis including age, gender, height, BMI, and eGFR, amplification was independently associated with height, BMI and eGFR ($\beta=0.213$, $P=0.012$; $\beta=0.264$, $P=0.002$; $\beta=0.206$, $P=0.006$, respectively, model adjusted $R2=0.203$).
Conclusions: Amplification is greater in adolescents (15-18 years) than in younger children (5-10 years) and is independently associated with BMI, height, and renal function.

P7.9
ELEVATED ARTERIAL STIFFNESS PRECEDES DEVELOPMENT OF HYPERTENSION IN NEVER TREATED PREHYPERTENSIVE PATIENTS

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Objective: Arterial stiffness and arterial blood pressure (BP) share similar natural history. To which extent the first causes the latter is unknown. Our study describes the development of pulse wave velocity (PWV) and BP in untreated, prehypertensive patients after one year of follow-up.
Patients and methods: Longitudinal study including 427 consecutive, never-treated patients with suspected hypertension. After standard clinical assessment, including PWV (Sphygmocor®, AtcorMedical), 125 showed normal office and ambulatory BP. According to the median baseline PWV , patients were divided into 2 groups: PWV+ and PWV-. After a median of 1.1 years, clinical assessment was repeated. PWV was adjusted to BP.
Results: 76 patients were female (60.8%), mean age was 47 years, baseline office and ambulatory BP were 126/76 and 120/77 mmHg, respectively. The PWV- group were significantly younger (40 vs. 52years, p<001), but systolic, diastolic and mean office BP did not differ compared to the PWV+ group. Only ambulatory SBP was significantly different(118 vs. 121, $p<0.03$). At follow-up, office systolic and MBP were significantly higher in the PWV+ group (129 vs. 123, $p<0.01$; 97 vs. 93, $p<0.02$, respectively), difference in ambulatory SBP remained significant (118 vs. 123; $p <0.02$). Follow-up PWV did not change in the PWV- group (adjusted PWV 6.9 vs. 7.0; p=ns), whereas PWV significantly improved in the PWV+ group (adjusted PWV 9.1 vs. 8.7; $p<0.01$).
Conclusions: Measurement of PWV in untreated prehypertensive patients allows to predict development of higher BP values whithin a year, suggesting that arterial stiffness may play a causal role for hypertension.

P7.10
PRE-TREATMENT AORTIC PULSE PRESSURE AS A POSSIBLE PREDICTOR OF FUTURE VISIT-TO-VISIT SYSTOLIC BLOOD PRESSURE VARIABILITY

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Background: Visit-to-visit systolic blood pressure variability (SBPV) in treated hypertensive patients may have impact on prognosis and it stimulates searching for its predictors. The aim of the study was to evaluate SBPV and its predictors in patients with controlled AH.
Methods: 52 pts(20 men, age58,9±9,0yrs;4 smokers;6 diabetics) with uncomplicated AH were treated to target BP<140/90mmHg with combination of RAAS-inhibitor and amlodipine for 1yr. Baseline BP was 163,4±8,1/100,9±4,2mmHg; achieved-123,7±9,7/76,8±6,7mmHg. SBPV was calculated as SD for 5 visits during 8 months after target BP achievement. Central BP and pulse wave velocity (PWV) were measured before treatment initiation and at the end of the study. $p<0,05$ was considered significant.
Results: SBPV after achievement of target BP varied from 1,79 mmHg to 16,79 mmHg (tertile I < 5,38; II 5,38 - 7,78; III > 7,78 mmHg). The groups were similar by age (I 56,6±8,94, II 59,4±9, III 60,7±9,1 yrs, $p>0,05$), gender, metabolic risk factors, baseline and achieved BP. Higher SBPV was associated with higher baseline central PP: for tertI 47,2±10,6, tertII 55,6±11, tertIII 51,1±11,5 mmHg ($p<0,05$ vs tertI). Number of patients with baseline central PP>50 mmHg was higher in the tertII(76,5%vs50% in tertII and 41%in tertI,Pearson's $\chi^2=2,1$;$p<0,05$) No significant difference was found for Aix@75HR(23,3±11,2 vs 23,2±13,4 vs 25,5±9,1% for corresponding tertiles,$p>0,05$) and PWV(13±1,6 vs14,2±2,2 vs12,9±1,8 m/s). No correlation was found between SBPV and any other characteristics, including baseline central PP.
Conclusion: Association between baseline central PP and SBPV after achievement of target BP confirms the role of arterial stiffness as predictor of BP variability.

P7.11
TESTOSTERONE AND CARDIOVASCULAR PERFORMANCE; THE IMPACT OF THE ANDROGEN DEFICIENCY IN ARTERIAL-VENTRICULAR COUPLING AND VASCULAR STIFFNESS DOCUMENTED BY 3D ECHOCARDIOGRPHY

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Purpose: Arterial-ventricular coupling (EA/ELV) constitutes an important determinant of cardiovascular performance and cardiac energetic. There is increasing evidence of testosterone influence to cardiovascular health. Aim of this work is to investigate the impact of testosterone deficiency (TD) on arterial-ventricular coupling, documented by the accuracy of the three dimensional echocardiography.
Methods: 76 men (56±11 years) underwent cardiac ultrasound and carotid-femoral pulse wave velocity (PWVc-f) evaluation. Based on systolic blood pressure (SBP), end systolic blood pressure was defined (ESP=0,9XSBP) and 3D- echo evaluation of ejection fraction (EF) and left ventricular outflow tract area (CSALVOT) were performed. Consequently left ventricular stroke volume (SV=VTI x CSA), end-diastolic (EDV) and end-systolic (ESV) volumes were estimated, followed by LV elastance (ELV=ESP/ESV-V0), arterial elastance (EA=ESP/SV) and arterial-ventricular coupling (EA/ELV) calculation. Testosterone deficiency considered when the total testosterone (TT) < 3.4 ng/m.