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

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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 (Alx) was measured by arterial tonometry. A successful KTx was defined by an estimated eGFR of ≥ 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 ± 0.33 to 10.3 ± 0.30 by 3 months ($P=0.042$), but cf-PWV gradually increased to 10.8 ± 0.31 and 11.2 ± 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 Alx 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 (Alx). 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 [FEV₁]), 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 ± 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 ($\beta=-0.45$, $p<0.001$) and pulse pressure amplification ($\beta=0.76$, $p<0.001$) was found.

Conclusion: Significant over-lap in "arterial stiffness" and "volume" types of arterial hypertension argues 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 (Alx) 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 Alx 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 Alx 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. Alx@HR75 also increased with age, and this increase was observed both during day- and night-time: <55 years Alx 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 Alx 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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(Alx) 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 Alx in different age groups.