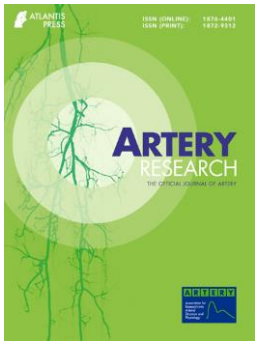

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P9.11: ANGIOTENSIN-CONVERTING ENZYME ACTIVITY IN NORMOTENSIVE WHITE AND AFRICAN MEN

J. Van Rooyen, M. Poglitsch, R. Schutte, H. Huisman, L. Malan, C. Fourie, C. Mels, W. Smith, R. Kruger, N. Malan, A. Schutte

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Chronic low grade inflammation and decreased glomerular characterized by CysC level may contribute to increased arterial stiffness in renal transplant recipients.

P9.8
ARTERIAL STIFFNESS AND PARAOXONASE ACTIVITY IN RENAL TRANSPLANT RECIPIENTS

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Increased lipid peroxidation and dyslipidemia are well known cardiovascular risk factors in renal transplanted (Tx) patients. Human serum paraoxonase (PON1) is the most potent high-density lipoprotein (HDL)-associated antioxidant enzyme. Previously decreased PON1 activity was shown in Tx recipients. Arterial stiffness parameters such as aortic augmentation index (AIx) and pulse wave velocity (PWV) are established markers of cardiovascular mortality in these patients. However, the association between PON activity and arterial stiffness has not been studied.
131 Tx patients and 63 age- and gender-matched healthy controls (C) were enrolled in the study. Lipid parameters and PON1 paraoxonase and arylesterase activities were measured. Arterial stiffness parameters (Aix, PWV, pulse pressure (PP), systolic and diastolic area indexes (SAI and DAI) and mean arterial pressure (MAP) were determined by arteriograph (Tensiomed).
Significantly lower paraoxonase and arylesterase activities were found in Tx patient compared to C subjects. Significantly higher MAP, PP, AIx and PWV, while significantly lower DAI and SAI were detected in Tx patients compared to C subjects. A significant negative correlation was found between arylesterase activity and PWV in Tx patients. Significantly higher total cholesterol (TC) and low-density cholesterol (LDL-C), while significantly lower HDL-C levels were found in Tx patients compared to C. Significant positive correlations were found between TC and PWV, and between LDL-C and PWV, while there were significant negative correlation between TC and DAI and between LDL-C and DAI in Tx patients.
Dyslipidemia and decreased antioxidant capacity characterized by PON1 activity may contribute to increased arterial stiffness in kidney transplant recipients.

P9.9
ALTERED DEPENDENCE OF AORTIC PULSE WAVE VELOCITY ON TRANSMURAL PRESSURE IN HYPERTENSION REVEALING STRUCTURAL CHANGE IN THE AORTIC WALL

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Aortic pulse wave velocity (aPWV), a major prognostic indicator of cardiovascular events, may be augmented in hypertension as a result of the aorta being stretched by a higher distending blood pressure or by a structural change. We used a novel technique to modulate intra-thoracic pressure and thus aortic transmural pressure (TMP) to examine variation of intra-thoracic aPWV with TMP in hypertensive ($n=20$, mean$\pm$SD age 52.1$\pm$15.3 years, BP 159.6$\pm$21.2/92.0$\pm$15.9 mmHg) and normotensive ($n=20$, age 55.5$\pm$11.1 years, BP 124.5$\pm$11.9/72.6$\pm$9.1 mmHg) subjects. aPWV was measured using dual Doppler probes to insonate the right brachiocephalic artery and aorta at the level of the diaphragm. Resting aPWV was greater in hypertensive compared to normotensive subjects (897$\pm$50 cm/s versus 784$\pm$43 cm/s, $P<0.05$). aPWV was equal in hypertensive and normotensive subjects when measured at a TMP of 96 mmHg. However, dependence of aPWV on TMP in normotensive subjects was greater than in hypertensive subjects (9.6$\pm$1.6 versus 3.8$\pm$0.7 cm/s per mmHg increase in TMP respectively, means$\pm$SEM, $P<0.01$). This experimental behaviour was best explained by a theoretical model incorporating strain induced recruitment of stiffer fibres in normotensive subjects and fully recruited stiffer fibres in hypertensive subjects. These results explain previous contradictory findings with respect to isobaric aPWV in hypertensive compared to normotensive subjects. They suggest that hypertension is associated with a profound change in aortic wall mechanical properties possibly due to destruction of elastin leading to less strain induced stiffening and predisposition to aortic dissection.

P9.10
EXCESS PRESSURE IS INDEPENDENTLY RELATED TO LV MASS AND CONCENTRIC GEOMETRY IN ESSENTIAL HYPERTENSION

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Arterial blood pressure (BP) can be decomposed as the sum of reservoir (Pres) and excess (Pexc) pressure. Pres is constant along the arteries and results in the minimum left ventricular (LV) hydraulic work, while Pexc is linked to the excess work of the heart. We evaluated the relationship of Pres and Pexc with cardiac structural features in hypertension
Methods: 446 never-treated hypertensives (mean age 48$\pm$11 years, 62% men, BP 148/92$\pm$16/10 mmHg) were evaluated through echocardiography, radial applanation tonometry (SphygmoCor) and 24-h ambulatory BP monitoring (SpaceLabs).Amplitudes and areas of Pres and Pexc were calculated using proprietary algorithms based on central pressure curves.LV hypertrophy was defined as LV mass >51 g/m2.7. Relative wall thickness (RWT) was expressed as: 2 x posterior wall thickness/LV diameter, and concentric geometry as: RWT>0.43
Results: Pexc and Pres were correlated with LV mass ($r=0.15$ and 0.17, respectively; both $p<0.01$) and RWT ($r=0.16$, $p<0.01$; $r=0.11$, $p=0.02$). After adjustment for age, sex, body mass index and 24-h systolic BP, subjects with LV hypertrophy had higher Pexc (18.4$\pm$10.3 vs 17.0$\pm$5.4 mmHg, $p=0.02$), but not Pres (39.8$\pm$12.6 vs 37.5$\pm$24.2 mmHg, $p=0.09$). In a multivariate model adjusting for multiple cardiovascular risk factors and other confounders, an increased Pexc independently predicted both LV mass ($\beta=0.08$, $p=0.04$, multiple $R=0.58$) and RWT ($\beta=0.10$, $p=0.02$, multiple $R=0.40$), while these relationship were not observed for Pres
Conclusions: LV mass and RWT are linearly and independently associated to Pexc, but not to Pres in untreated hypertension. Structural cardiac abnormalities may be related to an increase in Pexc

P9.11
ANGIOTENSIN-CONVERTING ENZYME ACTIVITY IN NORMOTENSIVE WHITE AND AFRICAN MEN

J. Van Rooyen [a], M. Poglitsch [b], R. Schutte [a], H. Huisman [a], L. Malan [a], C. Fourie [a], C. Mels [a], W. Smith [a], R. Kruger [a], N. Malan [a], A. Schutte [a]
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Background: The renin-angiotensin system (RAS) is a proteolytic cascade which consists of multiple enzymes and effector peptides. Angiotensin-Converting Enzyme (ACE) is one of the major enzymes in the RAS and catalyzing the decapeptide Angiotensin I to the octapeptide Angiotensin II. There are other non-RAS effects of ACE like mediating and/or modulating inflammation. We aimed to explore the ACE activity in white and black South African men and establish the associations with a marker of inflammation.
Methods: In a bi-ethnic sample ($n=30$) consisting of white and African men, the RAS-Fingerprinting was determined with LC-MS/MS quantification of Angiotensin peptides. Blood pressure and other variables were determined with known methods. Soluble urokinase Plasminogen Activator Receptor (suPAR) levels were determined using the suPARnostic® ELISA kit.
Results: From the RAS-Fingerprinting and ACE activity (product-substrate ratio) it is evident that ACE activity is significantly lower in the normotensive African men compared to white men. The higher ACE activity found in the white men associated positively with reactive oxygen species (ROS) ($r=0.59$; $p=0.02$) and with suPAR ($r=0.63$; $p=0.01$) but not in the African men.
Conclusions: The ACE activity is higher in the white men and it seems that ACE may drive inflammation only in the white participants.

P9.12
THE RELATIONSHIP BETWEEN RETINAL VESSEL CALIBRE AND NOCTURNAL DIPPING STATUS: THE SABPA STUDY

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Introduction: The relationship between a non-dipping blood pressure profile and retinal vessel calibre is not well established. A sustained increase in