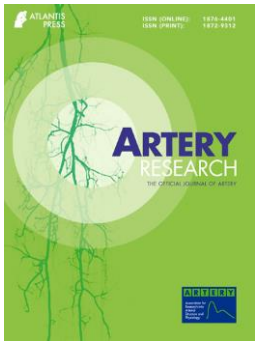

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P4.14: EXERCISE AORTIC RESERVOIR FUNCTION IN PATIENTS WITH TYPE 2 DIABETES IS ASSOCIATED WITH BRAIN ATROPHY

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where the strongest correlate was central systolic BP ($r=0.587$; $p<0.001$). aPWV was not related to AIx in either group ($p>0.05$ both).
Conclusions: Haemodynamic determinants of AIx in T2DM patients are significantly different to healthy people where BP is a dominant factor. In patients with T2DM, however, a high output, low resistance haemodynamic environment is associated with AIx.

P4.14
EXERCISE AORTIC RESERVOIR FUNCTION IN PATIENTS WITH TYPE 2 DIABETES IS ASSOCIATED WITH BRAIN ATROPHY

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Objectives. Vascular mechanisms underlying brain atrophy and white matter lesions (WML) in patients with type 2 diabetes (T2DM) are unknown. Increased exercising blood pressure (BP) is associated with end-organ damage and could explain these brain abnormalities. This study examined associations between exercise central haemodynamics and brain structure.
Methods: Forty healthy participants (53±9 years; 50% male) and 40 T2DM (62±9 years; 50% male) were examined at rest and during light exercise. Resting and exercise central haemodynamics, including systolic BP (SBP), pulse pressure (PP) augmented pressure (AP), augmentation index (AIx), aortic stiffness and aortic reservoir function (including excess pressure integral [xsP]) were recorded by tonometry. Segmented grey (GM) and white matter (WM) and WML volumes were derived from magnetic resonance imaging.
Results: T2DM participants had lower WM ($p=0.004$) and GM ($p=0.07$) volumes, and significant elevation of all central hemodynamic variables during exercise ($p<0.01$ all). At rest, greater central (not brachial) haemodynamics (SBP, AP, AIx and PP) were independently associated with greater WML volume ($\beta=0.54$, $p=0.031$, $\beta=0.55$, $p=0.01$; $\beta=0.46$, $p=0.046$ and; $\beta=0.48$, $p=0.01$, respectively) in controls (not T2DM). During exercise, increased xsP was independently associated with reduced WM ($\beta=-0.54$, $p=0.006$) and GM ($\beta=-0.63$, $p=0.013$) volumes only in T2DM independent of age, sex, heart rate, and 24-hour ambulatory SBP.
Conclusions: In T2DM, aortic reservoir function and transmission of excess pressure during exercise is associated with brain atrophy. These findings suggest that vascular mechanisms underlying structural brain changes may differ between healthy individuals and those with T2DM.

P4.15
RELATIONSHIP BETWEEN ARTERIAL STIFFNESS, CARDIAC BAROREFLEX SENSITIVITY AND BLOOD PRESSURE VARIABILITY IN NORMOTENSIVE HEALTHY ADULTS

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An increased arterial stiffness (AS) has been proposed as a likely mechanism for a reduced cardiac baroreflex sensitivity (BRS) and the associated increases in 24h blood pressure (BP) variability (BPV). Aim of the present study was to explore this issue in a group of 90 normotensive, non-obese, healthy adults (mean age 48±10 yrs, 50% F).
Methods: BRS was assessed by computer analysis of 10 min beat-to-beat BP and ECG recordings obtained in resting supine. The linear regression slope of spontaneous concomitant increases or decreases in systolic BP and RR interval were calculated, averaged and expressed as total slope of BRS (ms/mmHg). Simultaneous recordings of pulse waveform were obtained by means of a validated oscillometric device for ABPM (Mobil-O-Graph NG, IEM, Stolberg, Germany) with inbuilt transfer-function like method, and pulse wave velocity (PWV, m/s) calculated. BPV was assessed for systolic and diastolic BP as 24h standard deviation (SD), weighted 24h SD (wSD), daytime and night-time SD from 24h ABPM.
Results: In multiple linear regression analysis AS (assessed through PWV), had the strongest effect on BRS variation (beta:-0.50, $p<0.0001$), followed by HR and male sex. No significant effect was observed for age or MAP on BRS (See table). A similar independent analysis, showed a significant inverse relationship between BRS and daytime systolic BP SD (beta:-0,23; $p=0.036$)
Conclusion: Our findings suggest that in normotensive, otherwise healthy adults, decreased BRS and, indirectly, the associated increased day-time systolic BPV might be largely explained by an increased AS, independently of age and BP levels.

Predictors of cardiac BRS (Multiple linear regression analysis)

Variable (mean±SD)	Regression Coefficient	95% CI	Beta Coefficient	P value	R^2
PWV (6.12±1.53 m/s)	-3.619	-5.0, -2.2	-0,503	<0,0001	0,25
HR (64.2±9.4 bpm)	-0.426	-0.6, -0.2	-0,344	<0,0001	0,14
Sex (male)	-4.373	-8.4, -0.3	-0,212	0,029	0,04
Age (48±11 yrs)	-0.187	-0.7, 0,3	-0.187	0,547	-
MAP (97.9±8.8 mmHg)	-0.019	-0.4, 0.2	-0.077	0,759	-
R-Squared for the model including only significant variables (PWV, sex, HR)					**0,342**

P4.16
INSULIN RESISTANCE IS ASSOCIATED WITH INCREASED LARGE ARTERY STIFFNESS IN NORMOTENSIVE HEALTHY ADULTS

J. E. Ochoa [1,3], M. M. Correa [2], A. M. Valencia [2], J. G. McEwen [2], J. A. Gallo [2], G. Bilo [3], P. Salvi [3], D. Aristizabal [2], G. Parati [1,3]
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Aim: At present there is limited evidence on the relationship between insulin resistance (IR) and measures of large artery stiffness (AS) and wave reflections in normotensive healthy adults. Aim of the present study was to explore this issue in 90 normotensive (Systolic(S) blood pressure(BP) 107.1±9.3; diastolic (D) BP 69.6±7.7 mmHg), normoglycemic, non-obese, otherwise healthy adults (mean age 48 ± 10 yrs, 50% female).
Methods: IR was assessed with HOMA-Index and subjects were classified into IR tertiles, based on the distribution of HOMA-index values. Recordings of pulse waveform were obtained by means of a validated oscillometric device (Mobil-O-Graph NG, IEM, Stolberg, Germany) for ambulatory BP monitoring with in-built transfer-function like method. Aortic pulse wave velocity (PWV, m/s) and other measures derived from pulse wave analysis such as augmentation index (AIx, %), central SBP (cSBP), central DBP (cDBP) and central pulse pressure (cPP) were computed. Peripheral SBP and DBP, and heart rate (HR) were recorded and pulse pressure (PP) calculated as the difference between SBP and DBP.
Results: After multiple regression analysis adjusting for age, sex, HR and BMI, there was a significant overall effect of IR on measures of large artery stiffness and in central and peripheral BP levels. IR was associated with increased aortic PWV, and with higher central and peripheral SBP and DBP levels. See table.
Conclusion: our results indicate that in normotensive, healthy adults, IR may induce significant increases in large artery stiffness (as assessed with aortic PWV) and in central and peripheral BP levels.