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P93: RELATIONSHIP BETWEEN AORTIC PULSE WAVE VELOCITY AND MID CEREBRAL ARTERY PULSATILITY INDEX IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE; PILOT DATA FROM THE ARCADE STUDY

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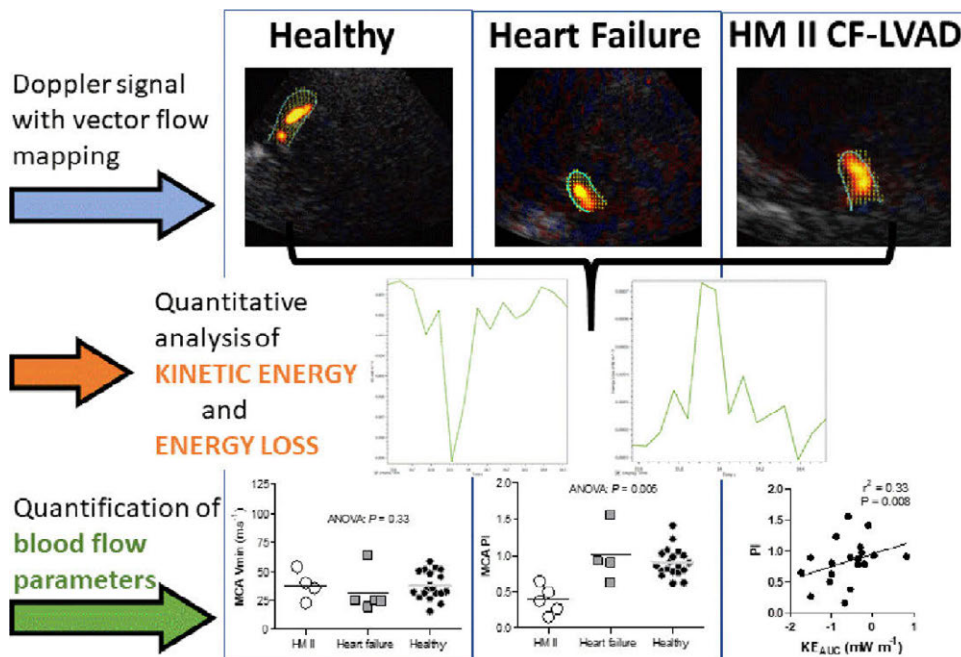
different heart rates (ELAUC/time & KEAUC/time) revealed the same results. PI correlated with KEAUC ($\log r^2 = 0.33$, $P = 0.008$) but not ELAUC ($\log r^2 = 0.154$, $P = 0.087$).

Conclusions: ELAUC and KEAUC were significantly lower in HM II. The correlation between KEAUC and PI suggests that pulsatility may have an important impact not only on the stretch of arteries but also on the energetics of blood flow. Future studies should evaluate the clinical meaning of these observations.

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PARAMETERS FOR CENTRAL BLOOD PRESSURE AS PREDICTORS FOR THE EARLY CLINICAL AND FUNCTIONAL OUTCOME AFTER STROKE

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THE EFFECTS OF DEVICE-GUIDED PACED BREATHING ON ARTERIAL STIFFNESS: IMPACT OF THE AUTONOMIC NERVOUS SYSTEM

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Objective: The autonomic nervous system (ANS) plays an important role in regulating blood pressure (BP), but its action on arterial stiffness (AS) is still debated. Here we examine if device-guided paced breathing (DGB) 1, via its action on ANS, can affect AS beyond its BP-lowering effect in hypertensive (HT) subjects.

Design and Methods: Central mean arterial pressure (MAP) (pulse-wave analysis of the radial artery, SphygmoCor, AtCor Medical, Australia), AS (carotid-femoral pulse wave velocity (cfPWV), SphygmoCor) and ANS activity (as high resolution heart rate variability (HRV) of low-frequency/high-frequency range (LF/HF)), (Schiller Medilog AR12plus, United States) were determined in HT subjects. All measurements were performed in supine position after 15 min of rest and subsequently repeated during supervised DGB therapy.

Results: 33 HT patients (18 male); age (mean \pm SD) 46 ± 13 years; BP $144 \pm 19/86 \pm 9$ mmHg; cfPWV 9.9 ± 2.1 m/s were recruited. DGB decreased (mean [95% CI]) LF/HF by 0.15 [0.08, 0.22] as well as MAP (-6.7 [$-8.4, -5.1$] mmHg) and cfPWV (-1.1 [$-0.8, -1.3$] m/s), all $P < 0.01$. Bivariate analysis showed a positive correlation between decrease in HRV activity and reduction of cfPWV and MAP ($\beta = 0.476$ and $\beta = 0.402$ respectively, both $P < 0.05$). The relationship between cfPWV and HRV activity was also still significant in multi-regression models adjusted for confounders (baseline PWV value and change in BP), $P < 0.05$.

Conclusions: DGB, via its action on ANS, affected both BP and AS in HT subjects. Reduction of cfPWV was not fully explained by the BP-lowering effect suggesting that the ANS may play an independent role in modulating AS.

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Background: High mortality and the rate of patients who depend on care after survived stroke illustrate the importance of prevention and the importance of the development of predictors to identify patients with a high risk for an adverse progress of disease. The level of the arterial blood pressure depends especially on the function of vessels. This function can be described by the pulse wave velocity (PWV). New studies show that there is a correlation between the central blood pressure and possible damages of end organs like heart, kidney and brain.

Methods: In a prospective study, we enrolled patients with acute ischemic stroke 7 ± 2 days after stroke onset. We conducted a 24-h blood pressure measurement as well as a pulse wave analysis with the Mobil O Graph (I.E.M., Stolberg, Germany 2009). We objectified the functional outcome after stroke on basis of the National Institute of Health stroke scale (NIHSS).

Results: In univariate analysis, we show that patients with a good early outcome after stroke have a significant lower PWV ($p = 0.027$). Central systolic blood pressure (cSBP), central diastolic blood pressure (cDBP), central pulse pressure and augmentation index were tendentially but not significantly lower in patients with good early outcome.

Conclusion: In ischemic stroke low aortic stiffness is associated with good early outcome. Patients with good early outcome had tendentially but not significantly lower cSBP and cDBP.

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RELATIONSHIP BETWEEN AORTIC PULSE WAVE VELOCITY AND MID CEREBRAL ARTERY PULSATILITY INDEX IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE; PILOT DATA FROM THE ARCADE STUDY

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Background: Chronic obstructive pulmonary disease (COPD) is an inflammatory condition associated with increased cardiovascular risk. COPD patients have increased aortic stiffness and increased risk of stroke. In addition, increased mid cerebral artery pulsatility index (MCAPI) is associated with increased arterial stiffness and risk of stroke in patients with Diabetes. However, the mechanisms relating to the increased risk of stroke in COPD remain unclear. Therefore, this study aims to investigate the relationship between aortic pulse wave velocity (aPWV) and the MCAPI in COPD patients.

Methods: This Cross-sectional evaluation included 20 COPD patients (mean \pm SD, age 69.0 ± 6.3 years) from the ACRADe study. aPWV was measured using the SphygmoCor system and MCAPI using transcranial Doppler ultrasound. In addition, forced expiratory volume in the first second/ forced vital capacity (FEV1/FVC) was measured using spirometry and quality of life was assessed using the St George's Respiratory Questionnaire (SGRQ). Measures of frailty were assessed using Time-Up-and-Go test (TUG) and the Comprehensive Geriatric Assessment (CGA).

Results: MCAPI was significantly associated with aPWV ($r = 0.518$, $P = 0.033$). aPWV was significantly associated with SGRQ disease impact ($r = 0.604$, $P = 0.010$) and also associated with TUG ($r = 0.561$, $P = 0.019$) and CGA ($r = 0.639$, $P = 0.006$).

Conclusions: These pilot data highlight the association between increased aortic stiffness and increased pulsatile flow velocity transmitted to the cerebral circulation of COPD patients. In addition, COPD symptoms, impact and frailty are both associated with increased aortic stiffness. However, more research is needed to investigate cause and effect between COPD symptoms, impact and its relationship between aPWV and cerebral flow pulsatility.

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EVALUATING CENTRAL PRESSURE IN PATIENTS WITH ACUTE ISCHEMIC STROKE IN ACUTE PHASE: PROGNOSIS AND OUTCOME

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Acute ischemic stroke (AIS) is defined as sudden onset of a neurologic deficit. It's the cause of about 85% of all strokes and the deficits last for more than 24 h. (1) Blood pressure (BP) is elevated in 75% or more of patients with acute stroke and different levels of peripheral BP at onset are associated with poor outcomes. In patients with AIS, management of blood pressure is still a matter of debate. Brachial pressure is a poor surrogate for aortic pressure and recent evidence suggests that central pressure is more strongly related to future cardiovascular events. In this pilot study we aimed to evaluate central pressure (CBP) in patients admitted with AIS in the acute phase (first 24 h). We evaluated 34 patients with a mean age of 72,7 years. Patients presented a mean NIHSS score 5,4 at admission (0-18) and NIHSS of 4 at discharge. Pre-AIS Rankin mean was 1 and at discharge was 2,1. Brachial systolic and diastolic blood pressures varied between 108 – 250 and 42–131 mmHg accordingly, with mean values of 147,48/78,21. Central BP varied from 102,5 – 215 mmHg systolic and 44–128,5 mmHg diastolic with mean value of 136,65/80,56 mmHg. In this sample, low values of both central and peripheral BP were associated with poor outcome (Rankin scale). This is an ongoing study aiming to evaluate central hemodynamic parameters in acute phase of AIS and at long term. The main goal is to enlarge our sample so we can be able to extract more and stronger data.

Poster Session II – Epidemiology

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BLOOD PRESSURE VARIABILITY, ARTERIAL STIFFNESS AND ARTERIAL REMODELING – THE MAASTRICHT STUDY

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Greater very short- to mid-term blood pressure variability (BPV) has been associated with an increased CVD risk, especially stroke. However, this link remains incompletely understood. We hypothesized that increased arterial stiffness and maladaptive carotid arterial remodeling may underlie this association. We therefore investigated the association between very short- to mid-term systolic BPV, aortic and carotid stiffness and carotid arterial remodeling using cross-sectional data from The Maastricht Study (aged 60 ± 8 years; 53% men). Aortic (carotid-femoral pulse wave velocity, $n = 1671$) and carotid stiffness (ultrasonography, $n = 1690$) were assessed. A composite index of systolic BPV was derived by standardizing and averaging systolic within-visit, 24-hour, and 7-day BPV. We performed linear regression analyses with adjustment for age, sex, glucose metabolism status, mean arterial pressure and cardiovascular risk factors. A 1-SD greater systolic BPV was statistically significantly associated with 0.10 m/s (95%CI: 0.01 – 0.20) greater cfPWV, but not with carotid distensibility ($-0.033 \cdot 10^{-3}$ /kPa [$-0.255 - 0.190$]). In addition, a 1-SD greater systolic BPV was statistically significantly associated with greater carotid circumferential wall tension (0.84 dyne/cm [$0.51 - 1.17$]), circumferential wall stress (0.79 kPa [$0.031 - 1.27$]) and intima-media thickness (8.6 μ m [$1.0 - 16.3$]). These results are indicative of maladaptive carotid remodeling, as circumferential wall tension and stress were not normalized despite greater intima-media thickness. In conclusion, greater very short- to mid-term BPV is associated with greater aortic stiffness and maladaptive carotid arterial remodeling, but not with carotid stiffness. These findings may explain, at least partially, the increased BPV-associated CVD risk, in particular stroke.

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ASSOCIATION OF METABOLIC SYNDROME AND ITS COMPONENTS WITH ARTERIAL STIFFNESS IN GENERAL POPULATION OF THE EVA STUDY

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Objective: The aim of this study is to investigate the relationship of Metabolic Syndrome (MetS) and its components with arterial stiffness in general population without cardiovascular diseases.

Design and method: Cross-sectional study of general population without cardiovascular diseases. There were included 500 subjects between 35–75 years old, selected by random sampling with replacement, stratified by age and gender groups using the Sanitary Card base of 5 urban health centers.

Measurements: Pulse wave velocity femoral carotid (cfPWV) was determined using the SphygmoCor System, Cardio Ankle Vascular Index (CAVI) using the VaSera. MetS was defined based on the Joint Scientific Statement National Cholesterol Education Program III.

Results: Mean age was 55.9 ± 14.2 years, mean cfPWV was 6.5 ± 2.0 m/sec and mean CAVI was 8.0 ± 1.4 . MetS was found in 14% of the subjects. cfPWV and CAVI were higher in subjects with MetS. All MetS components, except reduced HDL-cholesterol, were correlated with cfPWV and CAVI. With