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P11: EFFECT OF AGING ON THE PRESSURE ASYMPTOTE AND TIME CONSTANT OF EXPONENTIAL DIASTOLIC AORTIC PRESSURE DECAY IN HUMANS

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calcification. Development of aortic calcifications shares many similarities with atherogenesis, we thus hypothesize that people with short TL may have higher risk to develop aortic valve stenosis.

Methods: Aortic valves were obtained from 11 patients undergoing valve replacement surgery. Each valve cusp was macroscopically dissected into healthy, intermediate and calcified regions. DNA was extracted by phenol/chloroform method and TL measured by Southern blots of the terminal restriction fragments.

Results: TL from healthy and intermediate valve regions were similar and then merged in a non-calcified group. In all subjects, TL of calcified regions were shorter than TL in non-calcified regions. The gap between TL of non-calcified and calcified regions was 0,53kb ($p < 0.007$).

Conclusion: Calcified aortic valve regions have shorter telomere length than non-calcified. Directionality of the relationship between telomere dynamics and aortic valve stenosis will be explored *in vitro*.

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THE EFFECT OF CAFFEINE ON MENTAL STRESS RELATED CARDIOVASCULAR RESPONSE

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Background: Caffeine, the most widely used pharmacologically active substance causes mental stimulation and a slight raising of blood pressure. The aim of our work was to evaluate the effect of caffeine on the cardiovascular system during rest and during mental stress.

Methods: RR interval duration, arterial blood pressure and Laser-Doppler (LD) flux were monitored in 40 healthy volunteers (aged 21.98 ± 0.9 years) before and after ingestion of 200 mg of caffeine. The measurements were performed during rest (360s), during mental stress (90s) and during relaxation after mental stress (510s). The measurements were performed twice: under the effect of caffeine and under the effect of placebo. The study was approved by the National Medical Ethics Committee; written informed consent was obtained from each subject.

Results: During resting condition RR interval (ms) increased ($910,49 \pm 130,5$ before and $958,96 \pm 130,66$ after) ($p < 0,05$), systolic blood pressure (mm Hg) increased ($119,35 \pm 14,3$ before and $127,54 \pm 15,9$ after) ($p < 0,05$), diastolic blood pressure (mm Hg) increased ($68,78 \pm 11,2$ and $76,20 \pm 11,6$) ($p < 0,05$), LD flux decreased ($150,05 \pm 96,4$ and $115,15 \pm 86,7$) ($p < 0,05$) and temperature decreased ($30,92 \pm 3,5$ and $29,71 \pm 3,5$) ($p < 0,05$) after ingestion of caffeine. During mental stress systolic and diastolic blood pressure increased significantly less, RR interval was nearly the same and LD flux after mental stress increased more and earlier after ingestion of caffeine.

Conclusion: Although caffeine raises blood pressure it has favourable effect on the cardiovascular system during and after mental stress.

Poster Session I – Clinical aspects

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COMBINATION OF FLOW-MEDIATED DILATION AND PULSE WAVE VELOCITY PROVIDES FURTHER CARDIOVASCULAR RISK STRATIFICATION IN PATIENTS WITH CORONARY ARTERY DISEASE: FLOW-MEDIATED DILATION JAPAN STUDY A (FMD-J A)

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Purpose/Background/Objective: The usefulness of vascular function tests for management of patients with coronary artery disease (CAD) has not been fully investigated.

Methods: We measured flow-mediated vasodilation (FMD) and brachial-ankle pulse wave velocity (baPWV) in 462 patients with CAD for assessment of the predictive value of FMD and baPWV for cardiovascular events in a prospective multicenter observational study. The first primary outcome was

coronary events, and the second primary outcome was a composite of coronary events, stroke, heart failure, and sudden death.

Results: A median follow-up period was 49.2 months. First primary outcome occurred in 56 patients and the second primary outcome occurred in 66 patients. FMD above the cutoff value of 7.1%, derived from receiver-operator curve analyses for the first and second primary outcomes, was significantly associated with lower risk of the first (hazard ratio [HR], 0.27; 95% confidence interval [CI], 0.06–0.74; $P = 0.008$) and second (HR, 0.32; 95% CI, 0.09–0.79; $P = 0.01$) primary outcomes. baPWV above the cutoff value of 1731 cm/s was significantly associated with higher risk of the first (HR, 1.86; 95% CI, 1.01–3.44; $P = 0.04$) and second (HR, 2.19; 95% CI, 1.23–3.90; $P = 0.008$) primary outcomes. Among the four groups stratified according to the combination of cutoff values of FMD and baPWV, stepwise increases in the calculated risk ratio for the first and second primary outcomes were observed.

Conclusions: Both FMD and baPWV were independent predictors of cardiovascular events in patients with CAD. The combination of FMD and baPWV provided further cardiovascular risk stratification.

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EFFECT OF AGING ON THE PRESSURE ASYMPTOTE AND TIME CONSTANT OF EXPONENTIAL DIASTOLIC AORTIC PRESSURE DECAY IN HUMANS

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There are few data regarding the effect of aging on pressure asymptote (Pasymp) and time constant (Tau) of exponential diastolic aortic pressure (AoP) decay in normal human heart. To investigate this issue, we analyzed high-fidelity AoP, measured by use of a catheter-tipped manometer in 71 normal subjects who underwent diagnostic cardiac catheterization but who were found to have normal coronary artery and LV function. Subjects who had hypertension, diabetes or renal disease were excluded. There were 49 men and 22 women, ranging in age from 20 to 80 years. We analyzed diastolic AoP sampled every 5 ms from the point of minimal dP/dt to the top of ECG-R waves of the next beat, and estimated Tau and Pasymp by the exponential best fitting with a variable Pasymp results. Systolic AoP were significantly increased with age, but mean and diastolic AoP remained unchanged. Pasymp was 58.5 ± 8.1 mmHg and Tau was 436 ± 105 msec. Pasymp show no significant age-related change, but strongly and positively correlated with systolic, diastolic and mean AoP ($R^2 = 0.39, 0.70$ and 0.66 , respectively). For Tau, it was weakly and positively related with both age and AoP (Age: $R^2 = 0.20$, AoP: $R^2 = 0.08-0.20$).

Conclusion: We documented Pasymp and Tau of the Windkessel with the beating heart in normal humans. Tau was associated with aging, whereas Pasymp, which increased with the level of AoP, did not vary with aging per se, at least until the ninth decade. These data may provide insight into the understanding of AoP physiology.

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VALIDATION OF SYNTHESIZED CENTRAL PRESSURE WAVEFORM IN PATIENTS WITH AN INFRARENAL AORTIC ANEURYSM BEFORE AND AFTER ENDOVASCULAR REPAIR

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Background: Abdominal aortic aneurysm (AAA) disease is mainly treated by endovascular aneurysm repair (EVAR), which shows short-term advantages in terms of lower morbidity and mortality compared to open repair. Long-term outcome seems to be inferior with regard to survival. This could partly be explained by a change in dynamics of the aortic wall, including aortic central pressure (CP) waveforms, induced by the endograft (Figure). Arterial stiffness is predictive of cardiovascular disease but has not been investigated in AAA-patients. We investigated if CP and Augmentation index (AIX) can be calculated correctly in AAA-patients.