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P.049: THE P22PHOX -930A/G POLYMORPHISM OF NADPH OXIDASE: AN INDEPENDENT GENETIC DETERMINANT OF WAVE REFLECTIONS

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of the volume waveform matched the shape of the pressure waveform. Volume waveforms were found to lag pressure waveforms. Comparisons of the pressure and volume waveforms in two arms were made for different positions of the arms. Control measurements were taken with both hands at heart level. Zero time differential between the pairs of similar sensors was observed. The shapes of the pressure waveforms matched, as did those of the volume waveforms. As one arm was extended vertically, a time differential between the pressure waveforms and the volume waveforms appeared, with the pulse observed later in the extended arm. The time differential between the pressure and volume sensor on the extended arm appeared to lengthen, as did the width of the volume waveform. When the arm was returned to heart level, the shape of the volume pulse returned to normal over a maximum time of 35 seconds. When an arm was lowered, the pressure waveforms remained unchanged, but the volume waveform in the lowered arm was observed prior to the arrival of the volume waveform in the control arm.

P.048

IDENTIFYING ASSOCIATIONS OF REDUCED ADIPOSITY AND IMPROVED EARLY MARKERS OF ATHEROSCLEROSIS FROM A LIFESTYLE INTERVENTION AIMED AT OVERWEIGHT ADOLESCENTS

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Purpose: Overweight adolescents have increased early markers of atherosclerosis (flow-mediated dilation [FMD], carotid intima-media thickening [CIMT], pulse wave velocity [PWV]). We sought to identify associations of reduced adiposity (body mass index z-score [BMIz]) and improvement in these early markers over a 24-week diet-activity-behavior intervention.

Methods: N = 32 subjects (BMI >85thile, age 12-16 years) underwent vascular, lipid and glycemic assessments at baseline and 24 weeks. Univariate models evaluated associations of changes in markers with patient characteristics at baseline.

Results: After intervention, there was a significant reduction in BMIz (-0.09 ± 0.04 , $p=0.05$) and increase in HDL cholesterol (0.10 ± 0.02 mmol/L, $p=0.001$), but non-significant improvements in CIMT (-0.005 ± 0.004 mm, $p=0.16$), FMD (0.25 ± 0.68 %, $p=0.72$) and PWV (-0.24 ± 0.13 m/sec, $p=0.08$). Greater reduction in adiposity was associated with, at baseline, more episodes/week of vigorous activity (-0.05 ± 0.03 BMIz per 1 episode/week increase, $p=0.04$), and more hours/day screen time (-0.06 ± 0.03 BMIz per 1 hour/day increase, $p=0.03$). Improved CIMT was associated with, at baseline, more high-fat or high-sugar food servings/day (-0.002 ± 0.001 mm per 1 serving/day increase, $p=0.05$). Improved FMD was associated with, at baseline, lower fasting insulin (0.03 ± 0.01 % per 1 unit insulin decrease, $p=0.01$). Improved PWV was associated with at baseline more hours/day screen time (-0.06 ± 0.03 m/sec per 1 hour/day increase, $p=0.05$).

Conclusions: Reduction in adiposity and cardiovascular risk factors associated with our intervention may be insufficient to cause significant improvements in early atherosclerosis markers. A longer, more intensive intervention may be needed and subjects with more risk factors to target may benefit most.

P.049

THE P22PHOX -930A/G POLYMORPHISM OF NADPH OXIDASE: AN INDEPENDENT GENETIC DETERMINANT OF WAVE REFLECTIONS

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Introduction: Oxidative stress impairs wave reflections, which are independent markers and prognosticators of cardiovascular risk. The NADPH oxidase system maintains the redox state in the vessel wall. Recent studies have reported that the presence of allele G in the -930 polymorphic site of the p22^{phox} NADPH subunit is associated with increased enzyme activity, while the presence of allele A accounts for reduced activity. We investigated the relation between the -930^{A/G} polymorphism and wave reflections.

Methods: The study included 154 healthy individuals (102 males, mean age 40 years). The A-to-G substitution at position -930 in the p22^{phox} promoter was typed by BbvI digestion of specific polymerase chain reaction products amplified from genomic DNA. The AA, AG and GG genotypes were determined. Augmentation index (Alx) was measured as index of wave reflections, using a validated device (SphygmoCor).

Results: In our population, the prevalence of AA, AG and GG genotypes was 24%, 45.5% and 30.5% respectively. Multiple linear regression analysis revealed that after adjustment for age, systolic blood pressure, heart rate, gender, BMI and HDL cholesterol, subjects with GG genotype had significantly lower values of Alx by 5.89% compared to subjects with AA genotype ($p<0.01$), while subjects with AG genotype had significantly lower values of Alx by 4.77% compared to subjects with AA genotype ($p<0.01$).

Conclusion: Our findings suggest that the -930^{A/G} polymorphism of the p22^{phox} promoter of NADPH oxidase is an independent determinant of wave reflections in healthy individuals. Presence of the G allele is associated with lower values of Alx.

P.050

PREDICTIVE FACTORS FOR MACRO- AND MICRO-VASCULAR COMPLICATIONS IN TYPE 2 DIABETES

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Patients with type 2 diabetes (DM2) have the extremely elevated cardiovascular risk. The aim of our cross-sectional study was to estimate the prevalence of macro- and micro-angiopathy in DM2 patients and to search out possible predictors of both angiopathies.

The sample of 415 DM2 outpatients - 217 (52%) men and 198 (48%) women, aged 66 ± 9 y, average DM2 duration 9 ± 8 y, was divided into 4 groups: MMC+, n = 112 (with manifest macroangiopathy), MMC-, n = 303 (without it), mmc+, n = 222 (with manifest microangiopathy) and mmc-, n = 193 (without it). All observed parameters were assessed by standard methods and evaluated by the Wilcoxon's test and the multiple logistic regression model.

Patients MMC+ suffered more often from nephropathy (66 vs 39 %, $p<0.001$), neuropathy (24 vs 14%, $p<0.05$) and retinopathy (18 vs 11%, $p<0.05$) than patients MMC-. Independent risk factors for MMC+ development were the age over 60 y. (RR 1.09, $p<0.001$), plasma glucose level >5.6 mmol/L (RR 1.70; $p<0.05$) and hs-CRP >1 mg/L (RR 2.7; $p<0.05$). Protective factors for MMC+ was the female gender (RR 0.42; $p<0.001$), serum HDL-cholesterol >1 mmol/L (RR 0.15; $p<0.05$) and DBP >80 mmHg (RR 0.40; $p<0.01$). Duration of DM2 ≥ 9 y. (RR 1.16; $p<0.001$), the age ≥ 60 y. (RR 1.09; $p<0.01$) and hs-CRP >1 mg/L (RR 2.99; $p<0.01$) were considered as independent predictive factors for mmc+.

Macro- and microvascular complications are associated closely in diabetic patients. Low casual DBP (below 80 mmHg) respectively high pulse pressure, high age (over 60 y.) and high hs-CRP (over 1 mg/L) were considered as independent risk factors for the both angiopathies in DM2 patients.

P.051

ARTERIAL STIFFNESS IS INCREASED IN PATIENTS WITH HEPATITIS C VIRUS SEROPOSITIVITY, BUT NOT IN PATIENTS WITH HEPATITIS B VIRUS SEROPOSITIVITY AND THE ROLE OF LEPTIN

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Background: Recent data suggest that chronic systemic inflammation and impaired levels of adipose tissue hormones play a critical role in cardiovascular disease. Aortic stiffness and wave reflections are independent markers of cardiovascular risk. The present study was undertaken to assess whether chronic infection with hepatitis B virus (HBV) or hepatitis C virus (HCV) and the secondary steatosis in HCV patients affect aortic stiffness and wave reflections.

Methods: We studied 36 patients (mean age: 49 ± 15 yrs, 16M/20F) positive for HCV chronic infection and 28 patients (mean age: 56 ± 11 yrs, 19M/9F) with HBV chronic infection, who had never been treated with interferon, and 40 control subjects matched for classical risk factors. Aortic stiffness was evaluated with carotid-femoral pulse wave velocity (PWV) and wave reflections with augmentation index (Alx) of the aortic pressure waveform. Leptin levels were measured by ELISA kit.

Results: Patients with HCV infection had higher PWV than controls (7.6 ± 1.4 vs. 6.7 ± 1.3 m/s, $P<0.05$), while Alx did not differ (27.5 ± 15 vs. 27.1 ± 14 %, $P=NS$). Carotid-femoral PWV and Alx in the subjects with HBV infection were similar to those in the control subjects. After adjustment for confounding factors, leptin levels ($p<0.05$, $t=4.5$, stand. coefficient = 1) were independently associated with an increase in PWV in patients with HCV.