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P3.19: ASSESSMENT OF CARDIOVASCULAR RISK IN HYPERTENSIVES WITH WHITE COAT EFFECT VS. PATIENTS WITH MASKED UNCONTROLLED HYPERTENSION

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performance and peripheral vascular parameters associate with adherence to the Med-Diet in men with erectile disorder.

Methods: 150 ED patients (54±12 years) underwent cardiac ultrasound examination. E' / E' ratio and LV mass index (LVMI) were obtained to assess diastolic performance and myocardial strain respectively. Carotid-femoral pulse wave velocity (PWV) was used to evaluate central arterial stiffness and augmentation index (AIx) as a measure of wave reflections. Dietary habits were evaluated through a special diet score (Med-Diet score, range 0-55). Higher values indicate greater adherence to this pattern. ED severity was assessed by an international questionnaire, the SHIM-5 score.

Results: Population was divided into tertiles according to Med-Diet score (high >30, intermediate: 25-30 and low ≤ 25) with no significant differences in main risk factors between them. Low Med-Diet score patients had significantly higher LVMI and E'/E' compared to intermediate and high score population. Regarding vascular performance, both PWV and AIx were inversely correlated to the Med-Diet score subgroups as well as ED severity ($r = -0.245$, $P = 0.005$). Associations remained significant in multivariate analysis after adjustment for age, blood pressure and lipid profile.

Conclusion: Low adherence to the Mediterranean type of diet charges unfavourably cardiac structure and diastolic performance as well as peripheral and central vascular physiology. Our data may clinically assist ED patients in preventing further cardiovascular damage by adopting healthier dietary habits.

P3.16

CENTRAL ARTERIAL STIFFNESS AND SYSTEMIC VASCULAR RESISTANCE INFLUENCE ON LEFT VENTRICULAR GEOMETRY AND DIASTOLIC FUNCTION IN ESSENTIAL HYPERTENSION

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Purpose: Vascular resistance remains a key determinant of arterial hypertension and target organ damage alters morbidity of the disease. Our aim is to investigate physiology and clinical relevance of the left ventricular and systemic vascular interaction in essential hypertension patients.

Methods: 112 participants enrolled the study. Systolic (SBP) and diastolic blood pressure (DBP) as well as pulse pressure (PP) assessed the blood pressure load. Based on 2D echocardiography, left ventricular mass index (LVMI) and Doppler E' / E' ratio determinate ventricular geometry and diastolic performance respectively. Pulse wave velocity (PWV) was measured as determinant of central arterial stiffness and systemic vascular resistance (SVR) was calculated by the ratio of the mitral regurgitation velocity jet to the time velocity integral on the left ventricular outflow tract. We used standard Pearson correlations and bivariate regression analyses on matched pairs of surrogate variables.

Results: Participants demographics included mean age of 53 years old (27–74), BMI of 32 kg/m² (23–44), SBP of 142 mm Hg (137–172), and DBP of 84 mm Hg (60–110). Bivariate- r values for the chosen models are shown in Table. SVR was strongly correlated with both LVMI, E'/E' and PWV (all $P < 0.001$). All associations remained significant in logistic regression models after adjustment for age and BP.

Conclusions: LV geometry and diastolic performance are unfavorably influenced by both central arterial stiffness and systemic vascular resistance in primary hypertension. Our data reveal clinical information and interesting pathophysiology background in addition to standard BP components (SAP, DAP) in essential hypertension patients.

P3.17

THE EFFECTS OF ALPHA 1-ADRENOCEPTOR-BLOCKADE BY DOXAZOSIN AND ANGIOTENSIN CONVERTING ENZYME-INHIBITION BY RAMIPRIL ON CENTRAL AND BRACHIAL BLOOD PRESSURE AND VASCULAR REACTIVITY IN MILD-TO-MODERATE HYPERTENSION: THE DOXAZOSIN RAMIPRIL STUDY

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Objectives: To study whether inhibition of the renin-angiotensin-aldosterone system has effects on vascular function beyond blood pressure (BP) reduction alone.

Methods: Mild-to-moderate hypertensive patients (age 54±12 years, 34% women) were randomized double-blind to ramipril (10 mg od, n=33) or doxazosin (8 mg od, n=28) for 12 weeks. Central BP, pulse wave velocity (PWV), and augmentation index (AIx) were assessed by applanation tonometry (SphygmoCor, AtCor Medical). Endothelial function was studied by forearm post-ischemic flow mediated vasodilatation (FMD) and pulse wave analysis with beta 2-adrenoceptor-agonist stimulation, and by skin microcirculation iontophoresis (acetylcholine and sodium nitroprusside).

Results: Baseline central and brachial BP were 140/89 and 148/89 mmHg, carotid and brachial pulse pressures 51 and 60 mmHg, carotid-femoral and carotid-radial PWV 8.8 and 8.9 m/s, and AIx 30.1%. Treatment induced reductions (means±SEM) in central and brachial BP (-7.9±1.1/-6.6±1.1 and -6.0±1.0/-6.8±1.1%; all $P < 0.001$) with greater reductions in central BP (all $P < 0.05$), carotid/brachial pulse pressure ratio (-4.7±1.7%; $P < 0.01$), carotid-radial PWV (-2.9±2.0%; $P < 0.05$), and AIx (-15.9±4.5%; $P < 0.01$), but did not affect carotid-femoral PWV or carotid-femoral/carotid-radial PWV ratios. Ramipril induced greater changes than doxazosin in central and brachial systolic BP (-9.8±1.4 vs -5.4±1.6 and -7.9±1.3 vs -3.8±1.4%; all $P < 0.05$) but central/brachial BP ratio reductions were similar. All endothelial function indices suggested normal endothelial function (eg FMD 5.5±4.1%, reflection index 0.79±0.06) with no treatment effects.

Conclusions: Angiotensin converting enzyme-inhibition and alpha 1-adrenoceptor-blockade similarly reduce central BP more than brachial BP and improve indices of aortic stiffness. Evidence of endothelial dysfunction might require more advanced stages of hypertensive disease.

P3.18

COMPARISON OF STRUCTURAL AND FUNCTIONAL CAROTID AND AORTIC CHANGES IN DIABETES MELLITUS AND HYPERTENSION

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Background: It is known that age, blood pressure and diabetes mellitus are determinants of arterial stiffness. There are no studies comparing impact of hypertension and diabetes on structural and functional carotid and aortic changes.

Aim: The aim of the study was to evaluate structural and functional carotid and aortic changes in patients with diabetes without hypertension and patients with hypertension without diabetes.

Materials and methods: The study group consisted of 64 subjects without manifest cardiovascular disease (43 M and 21 F), mean age 54±10.4 years. Control group consisted of 40 healthy subjects. Patients were divided into two groups: group A with diabetes without hypertension (n=32), group B with hypertension without diabetes (n=32). From carotid arteries – ultrasound – IMT and from carotid arteries – high-resolution echo-tracking (eT) local arterial stiffness parameters were evaluated: β -beta, ϵ -epsilon, AI- augmentation index, PWV β -one-point pulse wave velocity; also aortic stiffness parameters: aortic distensibility, β -aortic stiffness and aortic pressure strain elastic modulus ϵ were calculated.

Results: In group A and group B mean values of IMT, eT and aortic stiffness indices were statistically significantly higher than in control group.

There was no significant differences in mean values of IMT, eT and aortic stiffness indices between two groups.

Conclusions: Impact of diabetes and hypertension on structural and functional carotid and aortic changes is equal.

P3.19

ASSESSMENT OF CARDIOVASCULAR RISK IN HYPERTENSIVES WITH WHITE COAT EFFECT VS. PATIENTS WITH MASKED UNCONTROLLED HYPERTENSION

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Background: According to current ESH guidelines cardiovascular risk assessment is recommended in vast majority of patients with hypertension. However the groups of patients exist where risk assessment may be challenging.

Aim: The aim of our analysis was to compare risk factors, and target organ damage profiles in two groups of hypertensive patients with discrepant results in office vs. ambulatory blood pressure values.

Methods: From the outpatient hypertensive cohort (N=773) two groups were chosen – (1) white coat effect patients “WCHT” with systolic office blood pressure (OSBP) > 140 mmHg, and 24-hour systolic blood pressure < 130 mmHg; and (2) patients with normal OSBP but 24-hour SBP > 130 mmHg “MHTN”. Anthropometric measurements, together with basic cardiovascular risk factors and target organ damage assessment were performed.

Results: In univariate analyses age, weight, BMI, waist circumference, as well as biochemical markers (total cholesterol, HDL, LDL-C, triglycerides, glucose levels) were comparable between the groups (P=NS, for all comparisons). MHTN patients presented with more pronounced target organ damage markers (eGFR, LVH, IMT) except for cfPWV (11.4 vs. 9.6 m/s for WCHT vs. MHTN, respectively; P<0.001). Nevertheless, the multivariate analysis adjusted to the levels of OSBP, HR and age showed marked attenuation of the observed PWV difference (P=0.84 for the model).

Conclusion: Single time office pulse wave velocity measurement in white coat effect presenting patients may not be a sufficient tool for the accurate assessment of subclinical damage. Thus sequential PWV measurement or other methods should be considered in this group of patients.

P3.21

ASSOCIATIONS OF INSULIN-LIKE GROWTH FACTOR AND ITS BINDING PROTEIN-2 AND 3 WITH BLOOD PRESSURE AND ARTERIAL STRUCTURE AND FUNCTION IN HYPERTENSIVE PERIMENOPAUSAL WOMEN

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IGFs and their binding proteins are increasingly recognized as important in understanding the pathogenesis of cardiovascular disease. During the transition from premenopause to postmenopause, many women experience weight gain, hence we hypothesized that circulating growth hormones can play a role in the pathogenesis of hypertension and subclinical organ damage in perimenopausal women.

The study included 152 women with newly diagnosed, never treated hypertension and 40 normotensive age-matched controls (mean age 51.73±1.82 years). In all subjects 24-hr ABPM, carotid ultrasound with measurement of intima-media thickness (IMT), and carotid-femoral pulse wave velocity (PWV) measurement (Sphygmocor) were performed. Serum levels of IGF-I, IGFBP2 and IGFBP3 and were measured using an immunochemical assay.

Results: Postmenopausal women (n=93) did not differ from premenopausal (n=99) in respect to mean arterial pressure (normotensive 85.2±5.6 vs 84.4±4.9 mmHg; hypertensive 99.5±5.9 vs 98.8±5.3 mmHg). Hypertensive women had significantly lower IGFBP-2 level than normotensive (162±83 vs 273±101 ug/l, p<0.001), groups did not differ in IGF and IGFBP3 concentration. IGFBP2 was the independent predictor of blood pressure in the examined group. In multivariate regression analysis after adjustment to age and BMI – IGFBP2 remained significantly negatively correlated to BP (β =−0.33, p=0.001). Odds ratio for hypertension per SD decrease in IGFBP2 was 3.43 (95% CI 1.65–7.13). IGFBP2 was independently of BP related with PWV (β =−0.22, p=0.05) but not with IMT (β =−0.14, p=0.22).

Conclusions: In perimenopausal women decreased IGFBP2 level may play a role in the blood pressure regulation. Further longitudinal studies are needed to elucidate the cardioprotective role of IGFBP2.

P4.1

ARTERIAL STIFFNESS IN INFLAMMATORY BOWEL DISEASE: A SYSTEMATIC REVIEW

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Background: Arterial stiffness is increased with chronic inflammatory disorders. The reduction of inflammation by immunomodulatory therapy is associated with a restoration of arterial function.

Objectives: To determine whether carotid-femoral pulse wave velocity (cf-PWV) is increased in subjects with inflammatory bowel disease (IBD).

Data sources. A systematic literature search for arterial stiffness in IBD was performed using PubMed and Google Scholar databases (last accessed on 11 June 2015). The search terms were “arterial stiffness,” “vascular stiffness”

or “pulse wave velocity” in combination with “inflammatory bowel disease,” “inflammatory bowel diseases,” “Crohn’s disease” or “ulcerative colitis.” Study eligibility criteria. Inclusion criteria included peer-reviewed publications reporting original data; a minimum of 10 subjects tested; and cf-PWV measured via validated devices.

Participants. Adults with IBD.

Methods: Publications with titles or abstracts appearing to meet the inclusion criteria were selected for detailed review. These articles were reviewed by two authors according to PRISMA 2009 guidelines.

Results: A total of 9 cross-sectional studies met the inclusion criteria (234 patients with Crohn’s disease (CD), 342 with ulcerative colitis (UC) and 435 control patients). One study only included patients with UC. Arterial stiffness was significantly increased in subjects with IBD in 8 studies and slightly but not significantly increased in subjects with IBD in one study.

Conclusions: Current cross-sectional studies suggest that arterial stiffness is increased in IBD subjects. Longitudinal studies are required to confirm preliminary data showing a reversibility of arterial stiffening by anti-TNF-alpha therapy. Systematic review registration number: CRD42015017364.

P4.2

CORONARY RISK IN RELATION TO GENETIC VARIATION IN MEOX2 AND TCF15 IN A FLEMISH POPULATION

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Aims: In mice, MEOX2/TCF15 heterodimers are highly expressed in heart endothelial cells and are involved in the transcriptional regulation of lipid transport. We investigated whether coronary heart disease (CHD) in humans is associated with variation in these genes.

Methods and results: In 2027 participants enrolled in the Flemish Study on Environment, Genes and Health Outcomes (51.0% women; mean age 43.6 years), we genotyped SNPs in MEOX2 and TCF15, measured baseline cardiovascular risk factors, and recorded CHD incidence. Over 15.2 years (median), CHD occurred in 106 participants. For SNPs, we contrasted minor-allele heterozygotes and homozygotes (variant) vs. major-allele homozygotes (reference) and for haplotypes carriers vs. non-carriers. Sex- and age-standardised CHD rates were higher in MEOX2 rs10777, rs12056299, rs7787043, rs4532497, rs1050290 variants, in MEOX2 GTCCGC haplotype carriers (prevalence, 16.5%), but lower in MEOX2 rs6959056 variants (P ≤ 0.04, adjusted for multiple testing). In multivariable-adjusted analyses, the corresponding hazard ratios were ≥1.50 (P ≤ 0.049), 1.77 (P = 0.0054) and 0.62 (P = 0.025), respectively. None of four TCF15 SNPs was associated with coronary risk (P ≥ 0.29). However, CHD risk associated with MEOX2 rs4532497 was confined to TCF15 rs12624577 variant allele carriers (P for interaction = 0.011). The MEOX2 GTCCGC haplotype significantly improved the prediction of CHD over and beyond traditional risk factors and was associated with similar population-attributable risk as smoking (18.7% vs. 16.2%).

Conclusions: In randomly recruited Flemish, genetic variation in MEOX2, but not TCF15, is a strong predictor of CHD. Further experimental studies should elucidate the underlying molecular mechanisms.

P4.3

PHYSICAL ACTIVITY IS ASSOCIATED WITH LOWER ARTERIAL STIFFNESS IN OLDER ADULTS: RESULTS OF THE SAPALDIA 3 COHORT STUDY

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