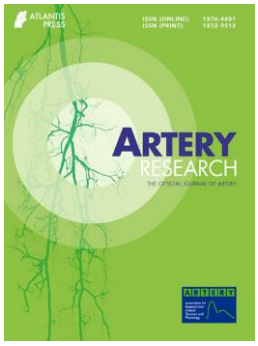

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11.3: ATHEROMATOSIS AND ENDOTHELIAL RESPONSE OF THE SMALL PERIPHERAL ARTERIES: A PERITONEAL DIALYSIS VERSUS HEMODIALYSIS PATIENTS MISMATCH

Athanasios Angelis, Nikolaos Ioakimidis, Penny Giannou, Ioannis Felekos, Vasiliki Kakiouzi, Konstantina Aggeli, Dimitrios Petras, Charalampos Vlachopoulos, Dimitrios Tousoulis

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10.10
HEMODYNAMIC CORRELATES OF THE LEFT VENTRICULAR MEAN EJECTION PRESSURE: A CAROTID TONOMETRY STUDY

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Background: The systemic arterial load imposed to the left ventricle (LV) is a major determinant of normal/abnormal cardiovascular function. The LV mean ejection pressure (LVMEP) is the best estimate of load faced by the LV throughout ejection. The contribution of the steady and pulsatile blood pressure (BP) component of arterial load to LVMEP is debated. We studied the hemodynamic correlates of LVMEP using carotid tonometry. Intensive care unit patients equipped with an indwelling catheter were studied, thus allowing precise calibration of the tonometer.
Methods: Carotid tonometry (Complior Analyse ® ALAM Medical, France) was prospectively performed on 28 hemodynamically stable, spontaneously breathing patients (12F, mean age+/-SD = 64+/-18 years). Carotid waveforms were calibrated from diastolic BP and time-averaged mean BP invasively obtained at the radial (n=18) and femoral (n=10) artery. All patients were free of aortic stenosis. LVMEP was the area under the systolic part of the carotid pressure waveform divided by ejection time.
Results: LVMEP (111+/-17 mmHg) was strongly related to central systolic BP (126+/-21 mmHg $r^2=0.97$) and was also related to mean BP ($r^2=0.82$), peripheral systolic BP ($r^2=0.83$), peripheral ($r^2=0.35$) and central ($r^2=0.50$) pulse pressure (each $P<0.05$). The LVEMP was not related to age, heart rate and stroke volume. Systolic pulse wave amplification ratio from carotid to periphery was 1.07+/-0.08.
Conclusions: Central systolic BP was strongly related to LVMEP, a measure of the load faced by the LV throughout ejection ($r^2=0.97$). Peripheral systolic BP may be less informative given variable systolic pulse wave amplification across patients.

11.1
ENDOTHELIAL FUNCTION IS IMPAIRED IN WOMEN WHO HAD PRE-ECLAMPSIA

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Background: Women with a history of pre-eclampsia (PE) are at higher risk of cardiovascular disease later in life. We evaluated the cardiovascular health of women who had PE in comparison with women who had normotensive pregnancies.
Methods: We assessed heart rate-adjusted augmentation index (AIx SphygmoCor), carotid-femoral pulse wave velocity (PWV SphygmoCor), carotid intima-media thickness (CIMT ultrasound) and brachial flow-mediated dilatation (FMD ultrasound) in women who were pregnant 1-30 years ago.
Results: A total of 166 women (86 cases, 80 controls) attended for vascular studies. Women with a history of PE had higher systolic blood pressure (SBP) (130±14 vs 122±10 mmHg $P<0.001$) and diastolic blood pressure (DBP) (82±9 vs 78±7 mmHg $P=0.001$) compared with controls. They also had a higher BMI (29.4±6.1 vs 26.6±4.5 kg/m^2 $P=0.002$). We found impaired endothelial function (FMD 5.9±3.3 vs 7.0±3.3 %, $P=0.017$) and greater PWV (7.8±1.6 vs 7.1±1.1 m/s, $P=0.002$) and heart rate-adjusted AIx (25.7±11.0 vs 22.5± 9.6 %, $P=0.023$) in cases compared with controls. There was no difference in CIMT ($P=0.110$). After adjustment for age, BMI and SBP the difference in endothelial function remained statistically significant ($P=0.014$).
Conclusions: Women who had PE have higher blood pressure and BMI compared to women at similar age who had normotensive pregnancies. A history of PE is also associated with impaired endothelial function which could explain the higher cardiovascular risk in this group.

11.2
CORONARY ARTERY DISEASE TOPOGRAPHY IN RELATION TO RHEOLOGY OF THE PERIPHERAL SMALL ARTERIES IN MIDDLE AGED ERECTILE DYSFUNCTION MEN

Athanasios Angelis, Nikolaos Ioakimidis, Konstantinos Rokkas, Dimitrios Terentes, Ioanna Gourgouli, Christos Georgakopoulos, Konstantinos Aznaouridis, Charalampos Vlachopoulos, Dimitrios Tousoulis
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Background: Middle age represents a life period where incidence of cardiovascular events typically augments. Our aim is to investigate any association between peripheral vascular rheology and distribution of coronary artery disease (CAD) in middle aged erectile dysfunction (ED) population.
Methods: 146 ED patients (46-61 y/o) with a coronary angiography documented single vessel CAD (> 50% of luminal narrowing) enrolled the study and divided into two subgroups according to the coronary lesions allocation. Patients with left main (LM), proximal or mid-left anterior descending artery (LAD) disease consisted Group 1. Group 2 included the rest of participants. All underwent carotid-femoral pulse wave velocity (PWV) augmentation index (AIx), carotid intima- media thickness (IMT) and peak systolic penile Doppler velocity (PSV) evaluation. Low PSV (< 25cm/sec) implies an impaired physiology of the peripheral small arteries network.
Results: Mean penile PSV was significantly lower in Group 1 compering to Group 2. ROC curve analysis revealed a cut-off value of 22.5 cm/s on PSV for detecting LM, proximal or mid-LAD coronary lesions (sensitivity of 79% and positive predictive value of 86 %). PWV, AIx and IMT did not differ statistically between two groups.
Conclusions: In middle aged ED patients, low penile arterial Doppler flow associates to an increased probability of CAD of the left main and left anterior descending arteries resulting in a theoretically larger jeopardized myocardial ischemic area. Our data may offer non- invasive clinical information on coronary artery disease topography of that special population suggesting further profound diagnostic and follow up strategies.

11.3
ATHEROMATOSIS AND ENDOTHELIAL RESPONSE OF THE SMALL PERIPHERAL ARTERIES: A PERITONEAL DIALYSIS VERSUS HEMODIALYSIS PATIENTS MISMATCH

Athanasios Angelis [1], Nikolaos Ioakimidis [1], Penny Giannou [2], Ioannis Felekos [1], Vasiliki Kakiouzi [1], Konstantina Aggeli [1], Dimitrios Petras [2], Charalampos Vlachopoulos [1], Dimitrios Tousoulis [1]
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Background: Peritoneal dialysis (PD) and hemodialysis (HD) are treatment options for end stage renal disease (ESRD). However, few are known on the cardiovascular impose of those therapeutic modalities. Our aim is to uncover endothelial damage and subclinical atheromatous process in male patients on chronic ESRD treated by either of those methods.
Methods: 84 male ESRD patients, 46 on HD and the rest 38 on PD without apparent cardiovascular disease enrolled the study. The two groups did not differ statistically in age, (64,9 vs 64) prevalence of hypertension, diabetes mellitus, smoking and lipid profile. All underwent common carotid ultrasound intima —media thickness (cIMT) evaluation to uncover subclinical atheromatosis. Endothelial function was estimated by the SHIM-5 score (theoretical range 0-25) that grades erectile potency, a nitric oxide depended phenomenon based on vasodilator ability of the penile vasculature. Higher grading indicates a healthier endothelial vascular status.
Results: HD patients had statistically higher cIMT (1.5 vs 0.85) and lower SHIM-5 score grading (8.8 vs 12.8) compering to PD patients. Statistics remained significant after adjustment for age, body mass index, presence of hypertension, diabetes mellitus, tobacco use and statin therapy.
Conclusion: Peritoneal dialysis ESRD male patients appear to have a favorable endothelial function and a mild atheromatous load as compared to hemodialysis patients. Our data may offer clinical information guiding further therapeutic efforts in patients with end stage renal disease, a special population where cardiovascular morbidity remains typically high.