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Background: It is suggested that, in resistant hypertension, the presence of particularly pronounced microvascular alterations may contribute to explain the relative lack of response to treatment. Similarly, in diabetic patients, the persistence of an altered microvascular structure, despite the administration of multiple drug combination treatment, might partly explain the difficulty to reach target blood pressure values, especially for systolic blood pressure.

Patients and methods: For this reason, we investigated a population of 94 treated essential hypertensive patients. Secondary forms of hypertension were excluded according to standard clinical evaluations and biochemical or instrumental assessment, and in all patients a 24-hour blood pressure monitoring was performed in order to exclude a white coat effect. In all patients, we evaluated small resistance arteries morphology by a wire micro-miographic approach (Mulvany's technique). A small amount of subcutaneous tissue was obtained by local biopsy or during election surgery and subcutaneous small resistance arteries were dissected and mounted on a myograph; the media to lumen ratio (M/L) was then measured.

Sixteen patients had true resistant hypertension, and were compared with the remaining 78 patients with non-resistant hypertension.

Results: The two groups were different in terms of mean age, pulse pressure/stroke volume, media to lumen ratio and internal diameter of small resistance arteries.

Conclusion: Our data suggest that hypertensive patients with true resistant hypertension have greater microvascular structural alterations compared with non-resistant hypertensive patients. This could explain, at least in part, the resistance to pharmacological treatment and the high cardiovascular risk observed in these patients.

P2.4

THE INFLUENCE OF ANTIHYPERTENSIVE TREATMENT ON ARTERIAL STIFFNESS, SHEAR STRESS AND ACTIVITY OF CHOSEN MATRIX METALLOPROTEINASES

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Objective: Comparison of therapeutic effects of chosen antihypertensive drugs on arterial stiffness, shear stress in carotid arteries and metalloproteinases activity, moreover analysis of relationship of these variables in the course of treatment.

Design and method: 95 never treated patients with HT stage 1 or 2 were randomized to 6 months monotherapy with: quinapril, amlodipine, hydrochlorothiazide, losartan or bisoprolol. Each therapeutic group consisted of 19 patients (N=19). Before and then after 1, 3 and 6 months of treatment carotid-femoral pulse wave velocity (PWV) by using a Complior device, ultrasound of carotid arteries were performed. Blood samples for the measurement of whole blood viscosity were taken during each visit. Shear stress (SS) was calculated on the basis of Irace formula. Serum concentration of metalloproteinase 3 (MMP-3) and plasma concentration of tissue inhibitor of metalloproteinase 1 (TIMP-1) were measured at the initial visit and after 6 months of treatment.

Results: ANOVA for repeated measurements revealed for all groups significant decrease of PWV and MMP-3 concentration and increase of shear stress in carotid artery and TIMP-1 concentration ($p < 0.05$). No between groups differences appeared in above effects ($p > 0.05$).

Conclusion: Irrespectively of chosen drug we observed similar effect for PWV drop. Reduction of arterial stiffness as a result of antihypertensive therapy is strongly connected with shear stress increase that is secondary to blood flow velocity growth and changes in connective tissue metabolism.

P2.5

SEX-DEPENDENT DIFFERENCES IN OBESITY INDICES AND INFLAMMATORY MARKERS IN NON-DIABETIC OBESE PATIENTS

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Background: The aim of the study was to assess sex-dependent differences of obesity indices and inflammatory markers in non-diabetic hypertensive obese patients.

Material and methods: 40 females and 25 males aged 59.8 ± 10.1 and 54.6 ± 11.9 years, respectively, were enrolled into the study. Serum TNF- α , IL-6 and high-sensitivity C-reactive protein (hs-CRP) levels were estimated. Waist circumference (WC), waist-to-hip ratio (WHR), body mass index (BMI), waist-to-height ratio (WHtR), visceral adiposity index (VAI) and body adiposity index (BAI) were measured or calculated.

Results: In males WC and WHR were higher than in females (117.0 ± 10.8 cm vs 108.5 ± 10.4 cm; $p < 0.01$ and 1.01 ± 0.06 vs 0.91 ± 0.06 ; $p < 0.0001$, respectively). In females BAI and hs-CRP were higher than in the males (41.7 ± 6.9 vs 33.5 ± 5.0 ; $p < 0.0001$ and 3.2 ± 2.2 mg/l vs 2.1 ± 1.5 mg/l; $p < 0.05$, respectively).

In females hs-CRP positively correlated with WHtR ($r = 0.321$; $p < 0.05$), BMI and BAI ($r = 0.305$; $p = 0.05$, and $r = 0.309$; $p = 0.05$, respectively). In males hs-CRP positively correlated with WHtR, BAI and VAI ($r = 0.458$; $p < 0.05$; $r = 0.440$; $p < 0.05$ and $r = 0.443$; $p < 0.05$, respectively), IL-6 positively correlated with VAI ($r = 0.472$; $p < 0.05$) and TNF- α negatively correlated with WHR ($r = -0.408$; $p < 0.05$).

Conclusions: Obesity related chronic inflammation is more evident in females than in males. Differences in WC, WHR and BAI are sex dependent.

P2.6

PWV IS AN INDEPENDENT DETERMINANT OF COGNITIVE DYSFUNCTION IN CKD PATIENTS

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Objectives: In the general population aortic stiffening assessed by carotid femoral pulse wave velocity (cf-PWV) is associated with cognitive dysfunction (CO/DY). Data in chronic kidney disease (CKD) are limited. Our study tests the hypothesis that large artery stiffness and microvascular damage in CKD patients are related to brain microcirculation changes reflected by impaired cognitive function.

Methods: Among 244 patients, finally 44 with CKD stage 1; 47 stage 2; 25 stage 3; 35 stage 4, with mean age 58.4 years (64.5% males), were enrolled in a cross-sectional study. Cognitive impairment measured by Mini Mental State Examination (MMSE), Clock – drawing test (Clock-test), and Instrumental Activity of Daily Living (IADL) was considered as primary outcome. We directly measured brachial, aortic, systolic blood pressure, pulse pressure, mean blood pressure and cf-PWV.

Results: Our patients revealed a significant linear deterioration in all the domains of cognitive function according to CKD stages, assessed by MMSE, Clock-test and IADL. The risk of cognitive dysfunction increased significantly from CKD stage 3 to 4 ($p < 0.01$). High levels of cf-PWV ($p = 0.029$) and aortic pulse pressure (aPP) ($p < 0.026$), were independent predictors of cognitive decline according to MMSE.

Conclusions: The present trial supports the interaction between the kidney and the brain injury microcirculation. In clinical practice cf-PWV and aPP measurements may help to predict cognitive decline. Whether, the reduction in aortic stiffness following an aggressive treatment translates into improved cognitive outcomes remains to be determined.

P2.7

AMELIORATION OF COGNITIVE FUNCTION IN HEMODIALYSIS PATIENTS IN ABSENCE OF HYPOTENSIVE EPISODES

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Objective: Patients in hemodialysis frequently have cognitive dysfunction (CO/DY). Hemodialysis session often results in acute intravascular volume loss, fluid shifts, hypotensive episodes, decrease of cerebral perfusion and cerebral ischemia, all of which may cause transient deterioration of cognitive function. On the contrary, improvement in "uremic milieu" after a dialysis session can result in improved cognition. The aim of this study is to evaluate the effect of a single, random hemodialysis session on cognitive function, in absence of hypotensive episodes.

Method: Global cognitive function was assessed, pre- and post-dialysis by using the Mini Mental State Examination.