7.6±1.9%, P<0.0001) and increased PWV (10.6±2.1 vs. 8.4±1.0 m/s, P<0.001) and IMT (690±120 vs. 570±110 μm, P=0.001). Oxygen administration almost completely restored FMD in CMS patients but had no effect in controls. These data demonstrate for the first time that chronic hypoxemia per se induces systemic vascular dysfunction in humans. We speculate that improving arterial oxygenation per se has favorable effects on CV morbidity and mortality in chronically hypoxemic patients.

P5.22
CAROTID AND AORTIC STIFFNESS IN PATIENTS WITH HETEROZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA

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Aim: The role of plasma cholesterol in impairing arterial function and elasticity remains not completely defined. We evaluated the arterial stiffness, measured locally in the common carotid artery with a high-precision echotracking, and aortic stiffness, measured with carotid-femoral pulse wave velocity (PWV) (the «gold-standard» measurement of arterial stiffness), in patients with never-treated heterozygous familial hypercholesterolemia (FH).
Subjects and methods: The study included 66 FH patients aged 10-66 years (38 (27-48) years) and 57 their first-degree relatives without FH aged 11-61 years (33 (23-42) years). Carotid-femoral PWV was determined by SphygmoCor (AtCor, Australia). The parameters of carotid stiffness β-index, Peterson elastic modulus (Ep) and local PWV were assessed at the common carotid artery 1cm before the bifurcation (Aloka Prosound Alpha7, Japan). Data are represented as median (25th-75th percentile).
Results: There were no differences in age, sex, high-density lipoprotein cholesterol (HDL-C), C-reactive protein (CRP), fibrinogen, lipoprotein(a) (Lp(a)), homocysteine, cases of hypertension. The FH patients had significantly elevated total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), triglycerides (TG), body mass index (BMI), frequency of tendon xanthomas, and coronary artery disease (CAD).
FH patients had significantly higher β-index (6,3(4,8-8,2) vs. 5,2(4,2-6,4), p=0,005), Ep (78(53-111)kPa vs. 62(48-79)kPa, p=0,006), local PWV (5,4(4,5-6,4)m/c vs. 4,7(4,2-5,4)m/c, p=0,005), but the same values of carotid-femoral PWV (6,76(7,0-7,92)m/c vs. 6,48(6,16-7,12)m/c, p=0,138).
Conclusions: Compared with their relatives, never-treated FH patients had stiffer carotid arteries but no differences in aortic stiffness.
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P5.23
TIMP1 PLASMA LEVELS ARE CORRELATED WITH ARTERIAL STIFFENING PROCESS

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Introduction: Arterial stiffness and left ventricle hypertrophy are associated with a decrease in collagen type1 degradation. Aim of our study was to address whether an increase in plasma levels of metalloproteinases-1 (MMP1, responsible for collagen type1 degradation) and her tissue inhibitor (TIMP1) are correlated to the presence of subclinical vascular organ damage (VOD) as defined by ESH-ESC Hypertension guidelines.
Methods: In 251 well-treated hypertensive outpatients (HT, age 57±12.5 years, Blood Pressure,BP,132±18/79±11mmHg mean±SD) we assessed carotido-femoral PWV (Complior) and we measured serum levels of MMP-1 and TIMP-1 (ELISA). Patients were divided in two groups, the first group including those with PWV<12m/sec (NOD) and the second one including patients with PWV ≥12m/sec, indicative of VOD.
Results: 93 patients showed VOD (37%), and 151 NOD (60%). VOD subjects were older than NOD (63±10vs53±12 years, p<0.001), had higher Systolic BP values (141±20 vs. 127±15mmHg, p<0.001) and higher TIMP1 plasma levels (162.27±46.3vs141.98±39.0, p<0,01), while there were no differences in MMP1. Furthermore in the whole population we found a correlation between PWV and TIMP1 (p=0.04, r=0,19), the correlation survived after adjusting for SBP but disappeared adjusting for age.
Discussion: In our study, HT patients with VOD were older and had higher SBP compared with NOD, they had also higher serum levels of TIMP1. Therefore TIMP1 plasma levels might be a further indicator of the cardiovascular aging process that is the first responsible of arterial stiffening.

P5.24
PULMONARY ARTERIAL HYPERTENSION AND ARTERIAL STIFFNESS

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Background: Endothelium plays an important role in the development and progression of Pulmonary Arterial Hypertension (PAH), independently of its aetiology. Little is known on derived central blood pressure (CBP) and arterial stiffness in PAH. The aim of this study was to describe CBP and arterial stiffness as measured by PWA (Aix).
Methods: We studied 21 PAH patients; 11 were first diagnosis and not treated (PAHNT, age 58±17 yrs, BP 135±33/81±16 mmHg, direct PAPc 49±13 mmHg mean±SD); 10 were under specific drugs (Calcium channel blockers, endothelin receptor antagonists, phosphodiesterase type 5 inhibitors, prostacyclin derivatives) (PAHT, age 67±8 yrs, BP: 136±28/72 ±14 mmHg, PAPc, 42±14mmHg). 10 age and sex matched subjects served as controls (C, age 61±15 yrs, BP:130±13/77±6 mmHg). We used applanation tonometry (Sphygmocor, AtCor) to study PWA and to derive CBP and Aix, which was used as an index of arterial stiffness.
Results: Both systolic and diastolic CBP were similar in the three groups. On the contrary Aix was higher in PAH than in C (26 ± 7.8 vs. 19 ±11.6%); among the two PAH groups, Aix was significantly higher in NT than in T (30±6.9 vs. 22±7.1% p<0.02). In PAH Aix showed significant correlation (p<0.05) only with BMI (r=-0.49).
Conclusions: Our data show that AIx is increased in PAH. They also show that it decreases in association with specific therapy. This pilot study suggests that AIx could be used in PAH as an additional non-invasive marker to assess the efficacy of therapy.

P5.25
CENTRAL PULSE PRESSURE AND AORTIC STIFFNESS DETERMINE RENAL ARTERY FLOW: HEMODYNAMIC MECHANISM PROPOSED FOR MICROALBUMINURIA

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A significant link has been shown between aortic stiffening and renal microvascular damage, but the underlying mechanism is not fully understood. We hypothesized that alterations in central and renal hemodynamics are responsible for this link. In 133 patients with hypertension, pressure waveforms were recorded on the radial, carotid, femoral and dorsalis pedis arteries with applanation tonometry to estimate the aortic pressures and aortic (carotid-femoral) and peripheral (carotid-radial and femoral-dorsalis pedis) pulse wave velocities (PWVs). Flow-velocity waveforms were recorded on the renal segmental arteries with duplex ultrasound to calculate the resistive index (RI) as [1 − (end-diastolic velocity/peak systolic velocity)], and on the femoral arteries to calculate the reverse/forward flow index and diastolic/systolic forward-flow ratio. (Micro)albuminuria was defined as urinary albumin/creatinine ratio (UACR) ≥30mg/gCr. The renal RI (mean, 0.65±0.07) was strongly correlated ($P<0.001$) with the aortic pulse pressure ($r=0.62$), incident pressure wave ($r=0.55$), augmented pressure ($r=0.52$) and aortic PWV ($r=0.51$), though not with the mean arterial pressure or peripheral PWVs. The correlations remained highly significant after adjustment for confounders including age, sex, hypercholesterolemia, diabetes and serum creatinine. The renal RI was inversely correlated with the femoral reverse and diastolic forward flow indices. Both aortic pulse pressure and renal RI correlated with UACR independently of the confounders. Each 0.1 increase in renal RI was associated with a 4.6-fold increase in the adjusted relative risk of (micro)albuminuria. In conclusion, increased aortic pulse pressure due to aortic stiffening causes renal microvascular damage through altered renal hemodynamics resulting from increased peripheral resistance and/or increased flow pulsation.