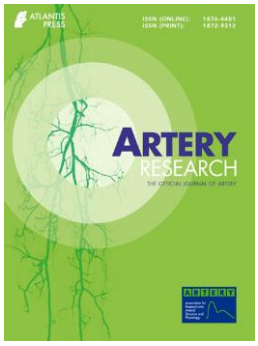

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P3.08: C-REACTIVE PROTEIN BUT NOT ADVANCED GLYCATION END-PRODUCTS ARE RELATED TO ALTERED GLUCOSE METABOLISM AND ARTERIAL STIFFENING IN THE MIDDLE AGED METABOLIC SYNDROME SUBJECTS: DATA FROM A CROSS SECTIONAL STUDY

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P3.05
UNFAVORABLE EFFECT OF ANDROGEN DEFICIENCY ON AORTIC STIFFNESS IN HYPERTENSIVE MALES AT LOW AND MODERATE CARDIOVASCULAR RISK

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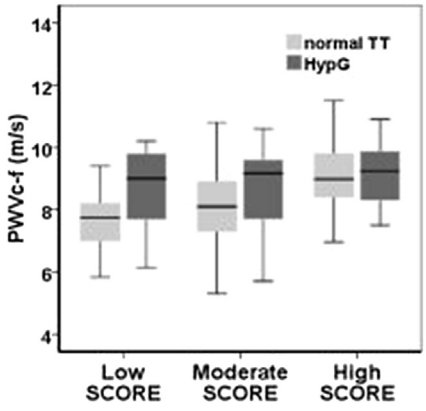
Objectives: Increased carotid-femoral Pulse Wave Velocity (PWVc-f) identify hypertensive patients at high CV risk, independently of systematic coronary risk evaluation (SCORE). Testosterone is associated with aortic stiffness, however whether this association is different in hypertensive patients with low or intermediate SCORE compared to high SCORE subjects is unknown.
Methods: Total testosterone (TT) and PWVc-f were measured in 311 non-diabetic hypertensive men with no evidence of clinical atherosclerosis. Hypogonadism (HypG) was defined when TT levels were below 3.4 ng/ml.
Results: The prevalence of HypG in hypertensive patients with low, moderate and high SCORE was 12.5, 15.2 and 28.2%, respectively. PWVc-f was significantly associated with TT in low ($r=-0.289$, $P<0.001$) and moderate SCORE ($r=-0.274$, $P<0.001$) patients but not in patients with high SCORE ($r=-0.092$, $P=0.33$). Subjects were then categorized by SCORE and further subdivided according to presence/absence of HypG. PWVc-f values of each SCORE/testosterone category are shown in figure. In low and moderate SCORE categories, patients with HypG had higher PWVc-f (by 0.92 m/s, $P<0.01$ and 0.55 m/s, $P<0.05$, respectively) compared to subjects with TT above the cut off level for biochemical definition of HypG. On the contrary, in high SCORE category, PWVc-f between patients with HypG and men with normal levels did not differ. It can be noted that low and moderate SCORE hypertensive patients with HypG had already elevated PWVc-f as compared to high SCORE men with normal TT.
Conclusions: The effect of low testosterone concentration on aortic stiffness is emphasized in hypertensive patients with low and moderate SCORE.



P3.06
ASSESSMENT OF ARTERIAL STIFFNESS DURING A FIVE-YEARS FOLLOW UP IN A GENERAL POPULATION IN NORTHERN ITALY

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Background: Carotid-femoral pulse wave velocity (cfPWV) is an independent predictor of cardiovascular events and its measurement is recommended by current hypertension guidelines. Few data are available on the progression of PWV over time. The aim of the present study was to assess the progression of aortic stiffness over a 5-year period in a general population in Northern Italy (Vobarno Study).
Methods: 227 subjects,42% males(age 50±4 years, hypertension in 51% at baseline visit, BL), underwent a BL and a follow up (FU) visit, after 5.1±0.4 years. In all subjects laboratory examinations, measurement of clinic and 24 hours blood pressure(BP) and of cfPWV were performed at BL and at FU.
Results: In the overall population cfPWV increased from 8.28±1.27 at BL to 8.51±3.2 m/s at FU($p<0.05$),change:0.22±1.25.cfPWV significantly increased from BL to FU in hypertensive subjects (HT)(from 8.61±1.41 to 8.90±1.40,$p<0.01$)but not in normotensives (NT)(from 7.97±1.03 to 8.11±1.11,p n.s).The absolute change in cfPWV from BL to FU progressively increased from -0.052±0.108 in NT, to 0.480±0.163 in treated HT and to 0.483±0.138 in untreated HT(p for trend<0.01);after adjustment for possible confounders(age, gender, BMI, baseline cfPWV and change in mean BP)the difference remained statistically significant. At multivariate analysis the variables independently related to the progression of cfPWV were cfPWV and mean BP at BL (beta -0.55, $p<0.01$,and beta 0.18,$p<0.01$,respectively) and the change in mean BP during follow-up (beta 0.20,$p=0.001$).
Conclusions: In a general population sample in Northern Italy the main determinants of the increase in arterial stiffness during a 5 years FU were cfPWV and mean BP at BL and change in mean BP over time.

P3.07
THE ASSOCIATION BETWEEN LOW BODY MASS INDEX AND ARTERIAL STIFFNESS IN AFRICANS: THE PURE STUDY

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Objectives: In developing countries, urbanization leads to changes in behavioural lifestyle and malnutrition which may lead to higher rates of cardiovascular disease .[1,2] We aimed to assess the association between low body mass index and markers of cardiovascular function like pulse wave velocity in Africans.
Methods: We included 496 Africans, aged between 35-65 years, with a low socio-economic status. They were stratified into a low BMI group with BMI ≤ 20 kg/m^2 and a normal BMI group with BMI ≤ 20 kg/m^2 and ≤ 25 kg/m^2. Blood pressure (OMRON HEM-757) and PWV (Complier SP) were recorded.
Results: African men with low BMI revealed significantly higher DBP (88.0 ± 13.4 mm/Hg) compared to the normal BMI group (84.2 ± 12.2 mm/Hg) and an increased arterial stiffness with significantly higher PWV (12.6 ± 2.47 m/s) compared to the normal BMI group (11.6 ± 2.00 m/s). The significant higher DBP and PWV remained after adjusting for confounders. The BMI scatter plot illustrated a negative tendency towards PWV in Africans ($r=-0.28$; $p<0.001$). This negative association between PWV and BMI in African men was confirmed with regression analysis. When adjusting for age, smoking, alcohol intake, BP and heart rate a J-curve was evident between PWV and BMI.
Conclusion: This indicates a detrimental effect of low BMI on vascular function which may contributes to the high prevalence of CVD and mortality in Africans.
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P3.08
C-REACTIVE PROTEIN BUT NOT ADVANCED GLYCATION END-PRODUCTS ARE RELATED TO ALTERED GLUCOSE METABOLISM AND ARTERIAL STIFFENING IN THE MIDDLE AGED METABOLIC SYNDROME SUBJECTS: DATA FROM A CROSS SECTIONAL STUDY

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Objectives: The aim of our study was to investigate the relationship between glucose metabolism, high sensitivity C-reactive protein (hsCRP), advanced glycation end-products (AGEs) and aortic stiffness in non-diabetic middle aged metabolic syndrome (MetS) subjects.
Methods: We studied a total of 486 non-diabetic subjects (aged 40-65, 61% women) with MetS but without overt atherosclerotic disease. AGEs were measured by skin autofluorescence while aortic stiffness was assessed as carotid to femoral pulse wave velocity (PWV) by applanation tonometry. Glucose metabolism was evaluated by oral glucose tolerance test.
Results: In univariate analysis, log transformed hsCRP were significantly associated with various indices of insulin resistance ($r_{HOMA-IR}=0.20$, $r_{QUICKI}=-0.20$, $p<0.01$) and PWV ($r=0.17$, $p<0.01$). This association remained significant in a separate analysis of men and women subgroups. The multivariate analysis showed that impact of hsCRP on PWV remains significant after adjustment for age, heart rate, mean blood pressure, insulin resistance

indices, smoking and MetS components ($p<0.01$). In contrast, AGEs measured by skin autofluorescence were not associated neither with indices of insulin resistance ($r_{HOMA-IR}$ =-0.04, r_{QUICKI} =0.03) nor PWV (r=0.02). Subjects with impaired vs. normal glucose tolerance had higher PWV (9.33±1.54 vs. 8.67±1.54 m/s) and hsCRP (3.54±3.3 vs. 2.53±2.55 mg/L), but not AGEs (2.11±0.41 vs. 2.17±0.44).
Conclusions: In the middle-aged MetS subjects without diabetes hsCRP but not AGEs measured by skin autofluorescence are related to both altered glucose metabolism and arterial stiffening. Our finding suggests that in early stages of the cardiometabolic disorder prevailing determinant of arterial damage is inflammation, but not tissue glycation.

P3.09
STIFFER ARTERIES IN "HEALTHY" SUBJECTS WITH COMPONENTS OF THE METABOLIC SYNDROME

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Objectives: To compare indices of vascular stiffness and markers of adiposity and inflammation in "healthy" subjects with/without components of the metabolic syndrome (met-x).
Methods: Subjects satisfying ≥1 (≥1 Met-X;) and no criteria (0 Met-X) were recruited (IDF 2006). All were lifelong non-smokers, normotensive, normolipidaemic and normoglycaemic. Augmentation index (AIx) and pulse wave velocity (PWV) were measured using applanation tonometry (Sphygmacor & Vicorder). Fasting leptin, adiponectin, IL-6, TNFα & MCP-1 were measured. Unpaired students t-test and Fischer's exact test was used to detect differences.
Results: Anthropometric, metabolic and haemodynamic indices of the met-x syndrome were significantly higher in the ≥1 Met-X group ($p<0.0001$). AIx and PWV were higher in the ≥1 Met-X group. The adipose related hormones, leptin and adiponectin were higher and lower, respectively, in the ≥1 Met-X group but the pro-inflammatory markers, IL-6, TNFα & MCP-1 were not different (Table 1).

Table 1 Body fat composition, arterial stiffness and humoral adipose/pro-inflammatory markers in subjects with/without early signs of met-x. Results are mean±SD.

	0 Met-X criteria	≥1 Met-X criteria	*P*
n	91	106	
Age (years)	37±10	40±8 years	0.06
Body fat (%)	22.64±6.74	30.44±7.71	<0.0001
AIx (%)	12.83±13.60	19.28±13.34	<0.001
PWV ($m.s^{-1}$)	6.82±0.85	7.14±1.20	<0.05
Leptin ($pg.mL^{-1}.10^{-2}$)	100.39±73.44	168.93±123.94	<0.001
Adiponectin ($pg.mL^{-1}.10^{-2}$)	77.54±41.10	53.91±31.98	<0.001
IL-6 ($pg.ml^{-1}$)	1.59±0.96	2.08±3.01	0.27
TNFα ($pg.ml^{-1}$)	2.98±1.10	3.29±1.50	0.21
MCP-1 ($pg.ml^{-1}$)	214.26±96.85	204.51±80.15	0.55

Conclusion: Subjects with early met-x have stiffer arteries than those with normal metabolic function. These results suggest that premature arterial stiffening may be mediated via hormonal rather than inflammatory mechanisms.

P3.10
GENETIC FACTORS VS CARDIOVASCULAR RISK FACTORS. WHAT IS MORE SIGNIFICANT IN VASCULAR AGING?

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Objective: Telomere length (TL) has been identified as a marker for biological, cardiovascular aging and cardiovascular events risk. Increased arterial stiffness and intima-media thickness (IMT) are the main signs of arterial aging and strong predictors for the development of cardiovascular disease. But the origin of the association between cardiovascular events risk and telomere biology is still unknown. The aim of this study was to determine the role of telomere lenght (a largely inherited component) and conventional cardiovascular risk factors (CVRF) (a largely acquired component) in vascular aging process.
Design: The study group included 146 patients free from established cardiovascular diseases, mean age 51,34 ± 19,02 years. Smoking, arterial hypertension, obesity, dyslipidemia, high fasting glucose level were considered as CVRF.
Methods: TL was assessed by quantitative polymerase chain reaction. IMT was determined by ultrasonography in both left and right carotid arteries. Arterial stiffness was appreciated by aortic pulse wave velocity (PWV) measuring with the help of SphygmoCor (AtCor Medical).
Results are summarized in the table.

	PWV	IMT
TL	r = -0,2657	r = -0,1861
	p = 0,0096	p = 0,0618
CVFR	r = -0,0983	r = 0,2997
	p = 0,264	p = 0,0005

Conclusions: TL has strong correlation with PWV, but not IMT. Opposite, the presence of conventional CVRF are contribute to subclinical atherosclerosis, not arterial stiffness. Thus, age-related changes in the vascular wall has different causes and requires an individual approach to the prevention and treatment.

P3.11
ETHNIC DIFFERENCES IN ARTERIAL WAVEFORM MEASURES IN A LARGE SAMPLE OF ADULTS ENROLLED IN THE VITAMIN D ASSESSMENT (VIDA) STUDY

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Few studies have examined whether central arterial waveform measures vary with ethnicity. We aimed to provide a more comprehensive examination of ethnic differences in several cardiovascular risk factors, which may reveal new ethnic variations. A cross-sectional (baseline) analysis of 5110 adults (2971 M, 2139 F; age range, 50-84 years) from multiple ethnic groups (European/Other, Maori, Pacific, South Asian) participating in a New Zealand clinical trial of the effect of vitamin D supplementation (the ViDA study) on cardiovascular disease events was carried out. Peripheral blood pressure was measured with an Omron T9P oscillometric device. Arterial pressure waveforms were derived from suprasystolic brachial measurement using a Pulsecor R6.5 device, which previously has been shown to yield central pressure measurements highly correlated with those from aortic catheterisation. These were decomposed into forward- and backward-travelling waves and reservoir wave analysis was applied to derive reservoir and excess pressures. Compared to European/Other participants, those in the other three ethnic groups had significantly higher peripheral augmentation index

Table: Preliminary data from the ViDA study.

Measure	Mean (SE)* European/Other (n=2959)	Mean difference (SE)* from European/Other			P-value#
		Maori (n=194)	Pacific (n=254)	South Asian (n=139)	
Brachial BP (mmHg)					
Systolic	139.5 (0.4)	2.9 (1.4)	2.4 (1.2)	-2.1 (1.6)	0.019
Diastolic	76.9 (0.2)	2.0 (0.7)	0.7 (0.7)	-1.5 (0.9)	0.009
Peripheral augmentation Index %	100.6 (0.9)	8.8 (2.9)	3.2 (2.7)	5.8 (3.4)	0.009

*Adjusted for age, sex and BMI; # P-value for variation across all 4 ethnic groups.