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### **P62: BLOOD PRESSURE LOWERING HALTS CAROTID ARTERY STIFFENING IN HYPERTENSIVE PATIENTS: THE CATOD STUDY**

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and diabetes. However, scanty data are available on the role of psychological factors on arterial stiffness. The aim of the current cross-sectional study was to evaluate the association between depression, anxiety, perceived stress, Type A personality, and Type D personality and Pulse Wave Velocity (PWV) in a cohort of hypertensive patients, using baseline examination data of the TIPICO project.

**Methods:** A total of 259 outpatients (ages 18–80 years) followed by the Hypertension Unit of S. Gerardo Hospital (Monza, Italy) affected by essential hypertension were recruited.

Aortic stiffness was evaluated by c-f PWV. Moreover, anamnestic data, clinical BP, and laboratory data were evaluated. Patients were asked to complete a battery of psychological questionnaires under the guidance of a psychologist.

**Results:** At T0 mean age was  $55.9 \pm 10.1$  years, SBP/DBP were  $135.6 \pm 17.7/82.5 \pm 9.1$  mmHg and PWV was  $8.6 \pm 2.1$  m/s. The multivariate stepwise linear regression analysis showed that age ( $\beta = 0.284$ ,  $p < 0.001$ ), pulse pressure ( $\beta = 0.369$ ,  $p < 0.001$ ), dyslipidemia ( $\beta = 0.130$ ,  $p = 0.012$ ), family history of CV disease ( $\beta = -0.123$ ,  $p = 0.017$ ), and depression ( $\beta = 0.126$ ,  $p = 0.014$ ) were significantly and independently associated with PWV.

**Conclusion:** Among psychological factors, higher levels of depression is related to higher PWV, while anxiety, perceived stress, Type-A personality and Type-D personality are not. Depression assessment and target intervention to reduce it should be recommended in hypertensive patients.

#### P61 PSYCHOLOGICAL DETERMINANTS OF TARGET ORGAN DAMAGE IN HYPERTENSIVE PATIENTS: FOCUS ON TYPE A PERSONALITY AND LEFT VENTRICULAR MASS INDEX

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**Background:** Increased Left Ventricular Mass Index (LVMI) is a well known risk factor for cardiac morbidity and mortality. Furthermore, it is widely recognized that clinical evolution and progression of established CV diseases

**Results:** At T0 the mean age was  $55.9 \pm 10.1$  years, SBP and DBP were  $135.6 \pm 17.7$  and  $82.5 \pm 9.1$  mmHg and PWV was  $8.6 \pm 2.1$  m/s. The multivariate stepwise linear regression analysis showed that sex ( $\beta = 0.252$ ,  $p < 0.001$ ), age ( $\beta = 0.135$ ,  $p < 0.037$ ), mean BP ( $\beta = 0.178$ ,  $p = 0.003$ ), family history of CV disease ( $\beta = 0.129$ ,  $p = 0.027$ ), and Type-A personality ( $\beta = 0.148$ ,  $p = 0.014$ ) were significantly and independently associated with LVMI.

**Conclusion:** Among psychological factors, higher levels of Type-A personality is related to higher LVMI, while Type-D personality, anxiety, depression and stress are not associated.

#### P62 BLOOD PRESSURE LOWERING HALTS CAROTID ARTERY STIFFENING IN HYPERTENSIVE PATIENTS: THE CATOD STUDY

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**Background:** We anticipate that in vascular outpatients followed over time, measured changes in arterial stiffness will be the multifactorial result of pressure-dependence, ageing-related degeneration, wall stress homeostasis, and medical treatment. Carotid ultrasound enables assessment of carotid pulse wave velocity (cPWV, via Bramwell-Hill), geometry (relative wall thickness,  $RWT = 2 \cdot IMT / \text{diameter}$ ), and intrinsic material stiffness (Young's-modulus, via Moens-Korteweg). We investigated changes in these carotid properties over time, and their interrelationship. To check whether the change in measured cPWV could be merely due to pressure-dependence, we calculated based on the stiffness index  $\beta_0$  [2] the theoretical pressure-dependent change in cPWV [3].

**Methods:** Hypertensive outpatients ( $n = 147$ ) were assessed at baseline and  $3.5 \pm 1.1$  year follow-up, and were stratified according to baseline-to-follow-up change in diastolic blood pressure ( $\Delta DBP$ ) into three groups: *decreasedDBP* ( $\Delta DBP < -7$  mmHg), *constantDBP* ( $-7 \text{ mmHg} \leq \Delta DBP \leq 7$  mmHg) and *increasedDBP* ( $\Delta DBP > 7$  mmHg), with the cut-off being twice the typical DBP measurement error [1].

**Results:** The theoretical pressure-dependent change in cPWV was  $0.4 \pm 1.3$  m/s lower ( $p < 0.001$ ,  $n = 147$ ), corroborating the anticipated multifactorial conditions. Table 1 shows no changes in cPWV, RWT and Young's-modulus for *decreasedDBP*. For *constantDBP*, both cPWV and Young's-modulus were increased at follow-up.

*IncreasedDBP* showed increases in cPWV and Young's-modulus and a decreased RWT. The latter implies a  $9.2 \pm 10.7$  kPa increase in circumferential wall stress ( $p < 0.001$ ), in contrast to a  $5.3 \pm 6.9$  kPa decrease ( $p < 0.001$ ) in *decreasedDBP* ( $p < 0.05$  for between groups).

**Table 1.** Changes in measure carotid properties with 3.5-year follow-up.

n = 147	$\Delta cPWV$ [m/s]		$\Delta RWT$ [-]		$\Delta \text{Young's-modulus}$ [MPa]	
	Mean $\pm$ sd	p	Mean $\pm$ sd	p	Mean $\pm$ sd	p
DecreasedDBP (n = 53)	$-0.1 \pm 1.4$	0.72	$0.00 \pm 0.04$	0.38	$-0.01 \pm 0.32$	0.87
ConstantDBP (n = 67)	$+0.6^* \pm 1.4$	<b>&lt; 0.001</b>	$0.00 \pm 0.04$	0.18	$+0.10^* \pm 0.26$	<b>&lt; 0.001</b>
IncreasedDBP (n = 27)	$+0.5^* \pm 1.5$	<b>0.029</b>	$-0.02^*, ** \pm 0.04$	<b>0.002</b>	$+0.19^* \pm 0.35$	<b>&lt; 0.001</b>

$\Delta$ s calculated as follow-up – baseline. \*:  $p < 0.05$  compared to decreasedDBP. \*\*:  $p < 0.05$  compared to constantDBP.

The bold indicates that there is a statistically significant difference between follow-up and baseline.

are related to a range of psychological characteristics, which may partially explain the spread and recurrence of these diseases. Little is known about LVMI and its association with psychological characteristics in arterial Hypertension (HT) patients. The aim of the current cross-sectional study was to evaluate the association between psychological characteristics and LVMI in a cohort of hypertensive patients.

**Methods:** A total of 244 outpatients (age 18–80 years) followed by the Hypertension Unit of S. Gerardo Hospital (Monza, Italy) affected by essential hypertension were recruited. Anamnestic data, clinical BP, and laboratory data and LVMI were evaluated. Patients were asked to complete a battery of psychological questionnaires under the guidance of a psychologist.

**Conclusions:** In this outpatient cohort, with clear DBP reduction, there is a discontinuation of carotid stiffening, but no reversal. In patients with increased DBP, progressive carotid stiffening appears driven by impaired wall stress homeostasis.

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### P63

#### CAN BRACHIAL OSCILLOMETRY IDENTIFY PREHYPERTENSION AMONG NORMOTENSIVE SUBJECTS?

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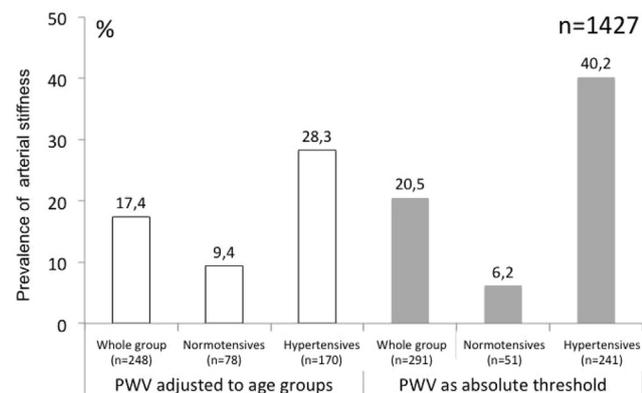
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**Background and objective:** Arterial stiffness (AS) reflects vascular damage. Our objective was to determine 1) the frequency of AS in community pharmacies, 2) if subjects with AS identified by brachial oscillometry have more CV risk factors than normal subjects, and 3) if the prevalence of AS varies upon using either age-adjusted values or a fixed threshold.

**Patients and method:** Observational, cross-sectional study in 32 community pharmacies of the Valencia Community, between 11/2015 and 4/2016. AS was measured as pulse wave velocity (PWV) with a semi-automatic, validated device (MOBIL-O-GRAPH®, IEM), followed by a 10-item questionnaire.

**Results:** Mean age of the 1427 consecutive recruited subjects was 56.6 years. Overall prevalence of patients with AS was 17.4% with age-adjusted PWV (9.4% in normotensives, 28.3% in hypertensives). AS showed independent association in normotensives with male gender, obesity, higher pulse pressure and heart rate, in hypertensives, with higher pulse pressure and lower age in multivariate logistic regression. Defining stiffness by  $PWV > 10$  m/s, AS was globally found in 20.5% of subjects, (6.2% in normotensives, 40.2% in hypertensives). It was associated with higher age and pulse pressure in both groups. Concordance in classifying stiffness was 74.6%.



**Conclusions:** Almost 10% of normotensives showed AS – measured by brachial oscillometry – when adjusting for age-groups. It was associated with male gender, pulse pressure, obesity and heart rate. In hypertensives, AS related to pulse pressure and inversely to age. Stiffness defined by 10 m/s is determined by higher pulse pressure and higher age. Both definitions of PWV are not interchangeable.

### P64

#### ARTERIAL STIFFNESS AND PULSE PRESSURE AMPLIFICATION IN ADULTS WITH ISOLATED SYSTOLIC HYPERTENSION

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**Background/aim:** ISH is usually considered more prevalent in aged individuals and associated to increased large artery stiffness. This study is aimed at identifying determinants of ISH in adult individuals.

**Methods:** 20 individuals <60 years, referred to the Outpatient Hypertension Unit for high blood pressure (BP) and treatment-naïve, were classified as normotensive (NT), true hypertensives (HT) or isolated systolic hypertensives (ISH) based on office BP. In all individuals the following measurements were obtained: carotid pulse wave velocity (PWV) and aortic BP by applanation tonometry (Sphygmocor CVP, Atcor), 24-h brachial and central BP (Oscar2, SunTech Medical), daily steps by 7-day actigraphy (Fitbit Flex).

**Results:** the three groups had similar clinical characteristics, including height and physical activity; only waist circumference was higher in ISH. PWV was normal in ISH and increased in HT. Office brachial and aortic pulse pressure (PP) were greater in ISH than in NT and HT, as well as 24-h brachial and central PP. PP amplification was similar in the three groups either when calculated by tonometry or in 24h.

	ISH (n = 7)	NT (n = 7)	HT (n = 6)
Men	5	5	4
Age (years)	43 ± 15	47 ± 10	41 ± 10
Height (cm)	174 ± 10	171 ± 11	174 ± 11
BMI (kg/mq)	26 ± 2	25 ± 2	24 ± 3
Waist circumference (cm)	93 ± 13*	81 ± 11	81 ± 9
Physical activity (daily steps)	13021 ± 4958	11569 ± 6789	13836 ± 4572
Mean BP (mmHg)	101 ± 9°	90 ± 8	102 ± 13°
Heart rate (bpm)	60 ± 6	61 ± 13	53 ± 10
Office PP (mmHg)	62 ± 9*	48 ± 7	50 ± 7
Aortic PP (mmHg)	45 ± 8*	38 ± 4	40 ± 6
24h-brachial PP (mmHg)	55 ± 9*	46 ± 9	51 ± 6
24h-central PP (mmHg)	43 ± 4*	37 ± 4	40 ± 4
24h- PP amplification (mmHg)	12 ± 5	9 ± 2	11 ± 3
Time to reflection (ms)	142 ± 15°	143 ± 13*	161 ± 21*
PWV (m/s)	6.3 ± 1.4°	7.2 ± 2.5°	8.0 ± 2.2*

\*:  $p < 0.05$  vs NT; °  $p < 0.05$  vs HT.

**Conclusions:** These preliminary data suggest that adults <60 years, newly diagnosed with ISH, present normal PWV and PP amplification from centre to periphery.

### P65

#### GENDER DIFFERENCES OF AORTIC WAVE REFLECTION AND INFLUENCE OF MENOPAUSE ON CENTRAL BLOOD PRESSURE IN PATIENTS WITH ARTERIAL HYPERTENSION

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**Background:** Evidences suggest that central hemodynamics indexes are independent predictors of future cardiovascular events and all-cause mortality. Multiple factors have been pointed to have potential influence on central aortic function: height, heart rate, left ventricular ejection duration and blood pressure level. Data related to the influence of gender and postmenopausal status on aortic wave form reflection is scarce.

**Methods:** In a cross sectional study 122 hypertensive patients (52 men and 70 women) were studied. Hypertension was defined as blood pressure (BP) levels  $\geq 140/90$  mmHg or use of antihypertensive drugs. Central arterial pressure, augmentation index (Alx) and augmentation index normalized to 75bpm (Alx75) were obtained using applanation tonometry. Menopause and postmenopause history were accessed by a direct questionnaire. Postmenopause was defined as at least one year since last menstruation. Patients were paired by age, gender and menopausal status and 4 groups were compared: group 1 (young men,  $\leq 48y$ ), group 2 (young women,  $\leq 48y$ ), group 3 (older men,  $>48y$ ) and group 4 (older women,  $>48y$ ).

**Results:** Height and weight were significantly lower in women than in men at the same age. Conversely, Alx ( $32.7 \pm 9.8\%$  vs.  $20.1 \pm 11.7\%$ ,  $p < 0.01$ ), Alx75 ( $29.6 \pm 6.7\%$  vs.  $18.3 \pm 9.4\%$ ,  $p < 0.01$ ) and central systolic blood pressure ( $136 \pm 30$  vs.  $125 \pm 23$  mmHg,  $p = 0.03$ ) were higher in women than men. The menopausal women had the worst indexes of aortic wave reflection.

**Conclusion:** Women patients had both higher reflected aortic pressure wave form and central blood pressure indexes and these findings were worsened by the menopausal status.