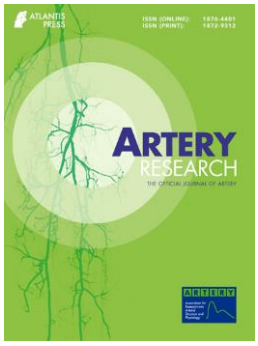

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P1.19: FAMILY HISTORY OF CARDIOVASCULAR EVENTS, ARTERIAL STIFFNESS AND CENTRAL BLOOD PRESSURE: THE GUIMARÃES STUDY (STUDY TO DETERMINE THE CARDIOVASCULAR RISK OF THE POPULATION OF GUIMARÃES/VIZELA: PREVALENCE OF ARTERIAL STIFFNESS AND EARLY VASCULAR

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P1.16

CLINICOPATHOLOGICAL FACTORS ASSOCIATED TO CENTRAL AORTIC PRESSURE PARAMETERS IN PATIENTS WITH HYPERTENSION

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Aim: To investigate association of central aortic pressure (CAP) parameters — augmentation index (AIx), augmentation index, normalized for heart rate 75/min (AIx75), augmentation pressure (AP), central systolic (SPa) and pulse pressure (PPa) with some clinical, laboratory and hemodynamic characteristics of patients with hypertension.

Material-Methods: 100 hypertensive patients at the age of 22—73 years (mean age 54±10,8) were examined, 43% men. Investigation included electrocardiography, echocardiography, determination of serum lipids, creatinine, creatinine clearance (CrCl) calculation, CAP registration using SphygmoCor device.

Results: AIx, AIx75, AP, PPa in women were higher than in men (30% vs. 20%; 28% vs. 17%; 14,5 vs. 8,7mmHg ($p<0,001$); 46,7 vs. 40,6mmHg ($p<0,05$); respectively), increased with older age ($r=0,28$; $r=0,23$; $r=0,36$; $r=0,33$ respectively; $p<0,05$), negatively correlated with CrCl ($r=-0,55$; $r=-0,56$; $r=-0,53$; $r=-0,34$ respectively; $p<0,05$). AIx, AIx75, AP negatively correlated with height and waist circumference ($r=-0,48$; $r=-0,61$; $r=-0,41$ and $r=-0,32$; $r=-0,36$; $r=-0,21$ respectively; $p<0,05$), positively - with LDL cholesterol ($r=0,22$; $r=0,22$; $r=0,24$ respectively; $p<0,05$). AIx, AIx75, AP, SPa correlated positively with late ventricular filling velocity ($r=0,23$; $r=0,29$; $r=0,26$; $r=0,27$ respectively; $p<0,05$). SPa correlated positively with myocardial mass ($r=0,24$; $p<0,05$), interventricular septum and posterior wall thickness ($r=0,36$ and $r=0,34$ respectively; $p<0,05$), negatively — with ratio between early and late ventricular filling velocity ($r=-0,28$; $p<0,05$). AIx and AIx75 negatively correlated with diameter of left atrium and end-diastolic diameter of left ventricle (LV) ($r=-0,23$; $r=-0,28$ and $r=-0,2$; $r=-0,29$ respectively; $p<0,05$).

Conclusions: As a result, parameters of CAP were associated with gender, age, anthropometric characteristics, renal disease, dyslipoproteinemia, LV hypertrophy and diastolic dysfunction.

P1.17

ARTERIAL STIFFNESS PARAMETERS AND AMBULATORY BLOOD PRESSURE MONITORING IN PATIENTS WITH HYPERTENSION

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Aim: To investigate correlation between ambulatory blood pressure monitoring (ABPM) parameters and central aortic pressure (CAP) parameters (which are the main indicators of arterial stiffness), such as: augmentation index (AIx); augmentation index, normalized for heart rate 75/min (AIx75); augmentation pressure (AP); central systolic (SPa) and pulse pressure (PPa) in patients with hypertension.

Material-Methods: 100 hypertensive patients at the age of 22—73 years (mean age 54±10,8) were examined, 57% women. Investigation included electrocardiography, echocardiography, ABPM, determination of serum lipids and creatinine. CAP was measured with applanation tonometry of radial artery using SphygmoCor device.

Results: Mean levels of AP, SPa, PPa positively correlated with 24h systolic BP (SBP) ($r=0,23$; $r=0,63$; $r=0,5$ respectively; $p<0,05$), 24h PP ($r=0,35$; $r=0,52$; $r=0,66$ respectively; $p<0,05$), daytime and nighttime SBP ($r=0,21$; $r=0,67$; $r=0,5$ and $r=0,19$; $r=0,5$; $r=0,44$ respectively; $p<0,05$), high BP load (HIdx) and area under curve (HIpt) of SBP ($r=0,19$; $r=0,6$; $r=0,47$ and $r=0,23$; $r=0,61$; $r=0,48$ respectively; $p<0,05$). AIx, AP, PPa negatively correlated with heart rate (HR) ($r=-0,22$, $p<0,05$). AIx, AIx75, AP, SPa correlated positively with the diurnal variability (SD) of SBP ($r=0,19$; $r=0,24$; $r=0,25$; $r=0,31$ respectively; $p<0,05$). SPa had positive correlation with 24h diastolic BP (DBP) ($r=0,44$; $p<0,05$), daytime and nighttime DBP ($r=0,48$ and $r=0,37$ respectively; $p<0,05$), HIdx and HIpt of DBP ($r=0,42$ and $r=0,45$ respectively; $p<0,05$), SD of DBP ($r=0,24$; $p<0,05$).

Conclusions: According to our study results, parameters of CAP positively correlates with all parameters of ABPM, except HR. Arterial wall stiffness increases in response to lower HR and/or higher BP during 24h.

P1.18

STATE OF TARGET-ORGANS IN GEORGIAN OBESE AND OVERWEIGHT HYPERTENSIVE SUBJECTS

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Obesity and hypertension (AH) are the most important related risk-factors of cardiovascular disease (CVD),so we examined differences in target-organ injury between obese and overweight hypertensive individuals. We studied 102 patients with mild to moderate AH (67males/35females, mean age 51,3±2,4years, BMI 30,9±1,9kg/m^2, duration of AH 4,6±1,4years). Examination included: ultrasound evaluation of left ventricular mass index (LVMMI), carotid artery IMT, of endothelial function of brachial artery; 24-hour BP monitoring. 49 overweight patients (25<BMI< 29,9kg/m^2) were assigned to group 1 and 53 obese patients (30kg/m^2) to gr 2.The groups were comparable by the age, duration of AH, daily mean BP values. Mean values of LVMMI (gr1:140,4±8,7gr/m; gr2:146,8±6,9gr/m) and IMT (gr1:1,02±0,03mm;gr2: 1,08±0,04mm) were certainly increased in obese patients compared with overweight ones ($p<0,001$). Prevalence of carotid atherosclerosis was higher in gr2 (79%vs67%). Endothelium — dependent vasodilatation (EDVD) (gr1:7,6±0,5;gr2:7,01±0,3%) was significantly reduced in obese patients ($p<0,01$), but occurrence of endothelial dysfunction was almost equal (gr1:59;gr2:60%). Occurrence of left ventricular hypertrophy (LVH) and especially of eccentric type was higher in gr2 (86vs81%; 38vs22 %, respectively), of concentric hypertrophy in gr1 (59vs48%). Normal geometry occurred only in gr1(4%). Number of *Non-Dippers* was higher in gr2(72vs67 %),of *Dippers* in gr1(30vs14 %). BMI positively correlated with IMT ($r = 0,25$, $p<0,02$) and LVMMI ($r = 0,41$, $p<0,01$) and negatively with EDVD ($r = -0,4$, $p<0,05$).Thus, in Georgian obese hypertensive subjects we detected more pronounced and frequent target-organ injury (mostly eccentric LVH, carotid artery affection - IMC thickening, endothelial dysfunction) and disorders of BP circadian profile comparing with overweight ones.

P1.19

FAMILY HISTORY OF CARDIOVASCULAR EVENTS, ARTERIAL STIFFNESS AND CENTRAL BLOOD PRESSURE: THE GUIMARÃES STUDY (STUDY TO DETERMINE THE CARDIOVASCULAR RISK OF THE POPULATION OF GUIMARÃES/VIZELA: PREVALENCE OF ARTERIAL STIFFNESS AND EARLY VASCULAR AGING SYNDROME)

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We observed 2123 subjects from two adjacent cities in the north of Portugal (Guimarães/Vizela) randomly selected from the population to include a cohort representative of age and gender distribution. We evaluated their clinical and metabolic characteristics. Relevant family history (FH) of cardiovascular events (CVE), Pulse Wave Velocity (PWV) and Central Blood Pressure measurements were collected. We considered positive FH (PFH) for CVE whenever one subject had two first degree family members with positive CVE history or one first degree relative with a premature CVE. Our goal is to understand if a PFH of CVE influences arterial stiffness (AS) / central hemodynamic parameters, increasing CV risk.

We found 227 subjects with strong PFH for CVE (61.2% females; mean global age of 65.5 years); they presented the following global mean values: PWV — 9.0 m/sec; Central SBP (cSBP) 134.0 mmHg; Central DBP (cDBP) — 79.6 mmHg; Central Pulse Pressure (cPP) — 54.5 mmHg; Augmentation Index (AI) — 34.1. When comparing these mean values with the ones of the remaining study population, we could find significant difference concerning PWV/ cSBP/ cDBP/ cPP / AI. When analysing the differences (concerning these variables) between the general population and the PFH population after dividing them by age classes, we could see that

almost statistically significant differences (p values ranging from 0.07 and 0.13) could only be recorded consistently in the 40-49 age class concerning PWV/ cSBP/ cPP / AI. Authors discuss the relevance of these findings concerning risk stratification in a Portuguese population with high incidence of stroke.

P1.20

ASSOCIATION OF THE CARDIO-ANKLE VASCULAR INDEX WITH AGE AND SEX IN THE SAPALDIA 3 COHORT STUDY

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Background: The ability to reflect age and sex specific alterations of the vascular system is an essential criterion of an arterial stiffness marker such as the cardio-ankle vascular index (CAVI). So far, there have been few systematic examinations of CAVI in Caucasian populations. Therefore, the association of CAVI with age and sex was studied within the second follow up of the Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults (SAPALDIA 3).
Methods: CAVI was measured using a VaseraVS-1500 vascular screening system (Fukuda Denshi, Tokyo, Japan) in supine position after 15 min of rest. The analysis involved t-tests, correlations and regression models and included 2971 persons aged 50-80 years (1488 males (M), 1483 females (F), 63.4±7.9 yrs) with an ankle brachial index equal to or greater than 0.9.
Results: In both sexes, CAVI increased significantly with age (M: $r=0.65$, F: $r=0.63$; each $p<0.001$) with a mean increment of 0.9 units per decade. CAVI values were higher in males than in females in every age group, statistically significant from 60 years upwards (mean CAVI±SD 50-59yrs M: 7.88±0.89, F: 7.81±0.82, $p=0.19$; 60-69yrs M: 8.84±0.94, F: 8.59±0.91, $p<0.001$; 70-80yrs M: 9.80±1.04, F: 9.47±0.97, $p<0.001$). The sex differences in mean CAVI values increased significantly with age ($p=0.005$).
Conclusion: Our results are consistent with existing findings in Asian study populations and suggest that CAVI represents an age and sex-sensitive measure of atherosclerotic risk also among Caucasians. Further analyses of CAVI will additionally include cardiovascular risk factors such as physical inactivity.

P1.21

ARTERIAL DISTENSIBILITY IN YOUNG INDIVIDUALS — COMPARISON OF ARTERIAL DISTENSIBILITY THROUGH THE MEASUREMENT OF PULSE WAVE VELOCITY IN YOUNG SPORTSMEN VERSUS NON-SPORTSMEN

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Withdrawn by the author

P1.22

NON-INVASIVE HAEMODYNAMIC CHARACTERIZATION BY MEANS OF IMPEDANCE CARDIOGRAPHY IN PRIMARY PREVENTION

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Background: Impedance Cardiography (ICG) is a non-invasive method to assess the main haemodynamic parameters: cardiac output, peripheral resistance, cardiac work, and thoracic fluid content. It provides critical information on a wide range of CV conditions, particularly hypertension and heart failure.
Objective: To study haemodynamic patterns in a defined group of patients, according to age and in a non-invasive manner.
Methods: In an observational study we analyzed haemodynamic data of 523 males out of 810 p. on primary prevention studied from DEC2010 to JAN2011.We used an Impedance Cardiograph (Z Logic (R)) following standard procedures. Data were analyzed in three groups: under 40, 40 to 59 and over 60 yrs, using boundaries for Cardiac Index(CI 2,5—4,2l/min/m2) and Peripheral Vascular Resistance Index(PVRI 1700—2600 dyn.seg.cm5.m2).
Results: Baseline data: Age 51 ± 13, SBP 137 ± 22, DBP 82 ± 11mmHg, HR 62 ±11bpm, BMI 27,7 ± 4kg/m2, 63%Hypertensives, 56%Dislypaemia.
A normal CI/normal or low PVR ratio was observed in 40% of young males, it halved in the 40-60 yrs group and was below 10% in the eldest.
The normal CI/high PVRI ratio was relatively stable, from 15% to 23%.
Finally, the low CI/high PVRI ratio rose from 27% in the young to 59% in adults and 74% in the elder, an indicator of Ventriculo-Arterial uncoupling.(see table)
Conclusion: Impedance cardiography is a non-invasive, cheap, easy-to-use and reproducible method that could provide useful information to take therapeutic decisions with CV patients.

HEMODYNAMIC GROUP	MALES < 40 N= 81	MALES 40 — 59 N= 307	MALES > 60 N=134
NORMAL CI NORMAL PVRI OR LOW PVRI	**33 (40,7 %)**	57 (18,6 %)	**12 (8,9 %)**
NORMAL CI HIGH PVRI	19 (23,5 %)	64 (20,8 %)	21 (15,5 %)
LOW CI HIGH PVRI	**22 (27,2 %)**	180 (58,7 %)	**100 (74,1 %)**
HIGH CI NORMAL OR LOW PVRI	7 (8,6%)	5 (1,6%)	2 (1,5%)
LOW CI NORMAL PVRI	0	1 (0,3%)	0

Ref: CI: Cardiac Index PVRI: Peripheral Vascular Resistance Index
Boundaries: CI: 2,5 — 4,2 l/min/m2 PVRI: 1700 — 2600 dyn.seg.cm5.m2

P1.23

CENTRAL AORTIC PRESSURE AND ARTERIAL STIFFNESS PATTERNS ACCORDING TO DRUGS AND GENDER IN HYPERTENSIVE PATIENTS

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Background: Previously we described differences in central pressures and arterial stiffening according to gender and age, which are related to increased risk in elder women (W) and different responses to treatment.
Objectives: To study different arterial stiffness patterns in essential hypertensives (H) according to gender and different antihypertensives.
Methods: We included 564 H from JAN2007 to DIC2010. Inclusion criteria: age >40 and <70,at least 2 CV risk factors and 6 mo.under stable monotherapy with atenolol (ATEN)n:114, amlodipine (AML)n:113, enalapril: (ENL) n:195 or losartan (LOS)n:142. A Control group (C) was also included (131p). All with a rate males/women (M/W) 2/1. Evaluations: BP, cIMT, Plaques, cf PWV, Endothelial Function (EF), Central/Peripheral Pulse Pressure (PPc/PPp) and Augmentation Indexes (Aix c /Aix p).(Hemodyn 4/Arteriograph ®). Statistics: t test , ANOVA, Dunnet p <0,05.
Results: (only signif.) Peripheral BP, PP and PWV were higher in H than C. PPc and Aix c were higher in H than in C and in W than in M in every group. Aix p in H, were higher and positive in W and lower and negative in M . PWV was higher in M than W only in H. (table attached)
Conclusion: According to PP and Aix, two patterns: In M a"central stiffness pattern" with lower PPc than PPp, negative Aix p and higher PWV.
In W a"peripheral stiffness pattern" with higher PPc, positive Aix p and lower PWV. This last pattern could be related with the increased risk in elder W and was not corrected by treatment.