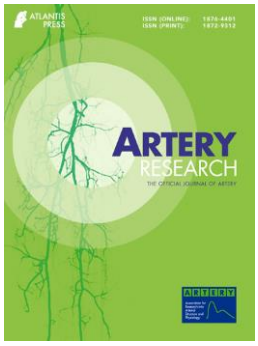

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P3.27: ASSOCIATION STUDY OF APOE POLYMORPHISMS WITH ESSENTIAL HYPERTENSION IN BULGARIAN PATIENTS

R. Tzveova, T. Yaneva, Y. Matrozova, S. Vandeva, G. Naydenova, D. Pendicheva, R. Tarnovska, R. Kaneva, G. Nachev, V. Mitev

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Africans, albumin excretion from spot urine samples predicts all-cause and stroke mortality.

P3.24
SEX-SPECIFIC ASSOCIATIONS BETWEEN CAROTID DISTENSIBILITY AND PRIOR BLOOD PRESSURE CATEGORIES — RESULTS FROM THE SAPALDIA COHORT

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Objective: Hypertension is a major risk factor of cardiovascular events. To identify potential sex specific differences in the association of prior blood pressure (BP) to arterial stiffness, we studies the relative change of lumen diameter for a given pulse pressure (distensibility) in participants of the SAPALDIA cohort study.
Methods: In the first follow up in 2002 brachial systolic and diastolic BP were examined in 6456 participants. They were divided into five BP categories (systolicBP/diastolicBP mmHg): 'optimal' $<120/<80$; 'normal' 120-129/80-84; 'high normal' 130-139/85-89; 'grade1 hypertension' 140-159/90-99 and 'grade 2+3hypertension' $\geq 160/\geq 100$. Participants were assigned to the higher category, if systolic and diastolic BP belonged to different categories. In the second follow up in 2010/2011, carotid lumen diameter of ultrasound images were analysed in 3489 subjects. BP was measured oscillometrically directly after the ultrasound examination. The analytic sample included 2576 participants with complete data. The sex-specific associations of distensibility and prior assessed BP categories were analysed using mixed regression models with fixed effects for sex, BP categories and their interactions, anthropometric parameters, classical risk factors, heart rate with random effects for study centres.
Results: Descriptive characteristics are shown in table1. The sex-specific adjusted average distensibility results are shown in figure1. A significant decline in distensibility with increasing BP category was observed compared to optimal BP category. A significant sex-specific difference was found for optimal BP category ($p = 0.001$).
Conclusions: Based on the assessment of carotid stiffness, BP control should be considered as an important therapeutic target both for men and women.

P3.25
THE EFFECT OF DIASTOLIC ASYMPTOTIC PRESSURE ON THE RESERVOIR PRESSURE IN HUMAN

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Background: Arterial diastolic asymptotic pressure (P_∞) is the pressure reached when the heart stops beating. Determination of the reservoir pressure (P_r) requires a value of P_∞ which was previously assumed (1), calculated (2) and measured (3, 4) as 0, 35, 14, 24 mmHg respectively. The effects of varying P_∞ on the determination of P_r is the primary objective of this study.
Methods: P_r was calculated from the carotid pressure of 2003 subjects of the Asklepios study (a) using a free fitting algorithm for the determination of P_∞ and (b) setting P_∞ to the average of the experimental values (19 mmHg).

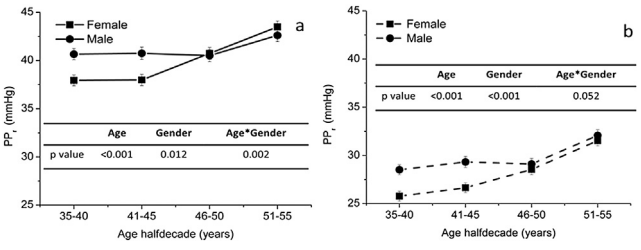

Figure 1. Changes of PP_r with age and gender using the free fitting algorithm (a) and 19mmHg (b).

Results: The reservoir pulse pressure (PP_r) is higher using the free fitting method than setting P_∞ (Fig1). PP_r increases significantly with age and is higher in male than female in both cases.
Conclusions: PP_r is generally higher in male than female and its absolute value is dependant on the value of P_∞. Higher values of PP_r suggests deterioration of the arterial buffering function with age.
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P3.26
ARTERIAL DISPENSABILITY IN STAGE 1 HYPERTENSION: COMPARISON BETWEEN PREMENOPAUSAL WOMEN AND MEN OF THE SAME AGE

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Objective: To investigate whether arterial distensibility in hypertensive premenopausal women differs from that observed in men and whether these differences may vary according to age.
Methods: We studied 385 young stage 1 hypertensives from the HARVEST study. Arterial distensibility predictors were included in regression analyses. Patients were divided into 3 age classes and differences in arterial distensibility parameters were examined with a 2-way ANCOVA using sex and age-class as factors.
Results: Despite better metabolic profile and lower systolic BP, women showed lower large artery (C1) and small artery (C2) compliance, higher augmentation index (AIx) and total peripheral resistances (TPR) than men (all age-adjusted $p<0.0001$). When data were adjusted for BP and heart rate (HR), lifestyle habits and metabolic parameters, differences remained highly significant (all $p<0.0001$). However, when height was included in the models only differences in C2 and AIx remained significant ($p=0.033$ and $p=0.001$, respectively). Systolic BP and HR (for C1 and C2), BMI and age (for C2 and AIx), sedentariety (for AIx), were significant determinants of distensibility parameters. In both genders C2 and AIx were closely correlated with TPR ($p<0.001$). The gender-related differences in distensibility parameters did not vary across the age classes with no significant interaction between age and sex.
Conclusions: The height accounts for most of the sex-related differences in arterial distensibility parameters. However, for C2 and AIx the differences persists after adjustment for height indicating that in premenopausal women hypertension is due to a high TPR condition which is accompanied by impairment of C2 and AIx.

P3.27
ASSOCIATION STUDY OF APOE POLYMORPHISMS WITH ESSENTIAL HYPERTENSION IN BULGARIAN PATIENTS

R. Tzveova [1,2], T. Yaneva [3], Y. Matrozova [5], S. Vandeva [5], G. Naydenova [6], D. Pendicheva [7], R. Tarnovska [3], R. Kaneva [1,2], G. Nachev [4], V. Mitev [1,2]
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Apolipoprotein E (*ApoE*) polymorphism influences lipid metabolism, but its association with essential hypertension (EH) is controversial.
The objective of this study was to examine the association between *ApoE* polymorphisms and EH in Bulgarian population.
We carried out a case-control association study involving 490 healthy Bulgarian individuals and 211 Bulgarian patients with EH (average of three measurements $\geq$140 mmHg in systolic and/or $\geq$90 mmHg in diastolic blood pressure). Genomic DNA was extracted from venous blood using Chemagic

Magnetic Separation Module I according to manufacturer's protocol. DNA samples were then amplified by real time polymerase chain reaction (real-time PCR), followed by High Resolution Melting Analysis (HRMA) on RotorGene 6000. Hardy-Weinberg equilibrium expectation was tested by using a chi-square ($\chi 2$) goodness-of-fit test. Non-adjusted analysis of the association between *ApoE* genotypes and alleles with essential hypertension was based on Fisher Exact Probability Test by using the Vassarstat calculator.
As found in most European populations, the $\varepsilon 3\varepsilon 3$ genotype was the most common (72.04%), followed by $\varepsilon 3\varepsilon 4$ (14.69%), $\varepsilon 2\varepsilon 3$ (9.80%), $\varepsilon 2\varepsilon 4$ (2.24%), $\varepsilon 2\varepsilon 2$ (0.82%), and $\varepsilon 4\varepsilon 4$ (0.41%) in control group. The genotype frequencies in hypertensive patients were: $\varepsilon 3\varepsilon 3$ (72.99%), $\varepsilon 3\varepsilon 4$ (16.11%), $\varepsilon 2\varepsilon 3$ (7.11%), $\varepsilon 2\varepsilon 4$ (2.37%), $\varepsilon 4\varepsilon 4$ (1.42%), $\varepsilon 2\varepsilon 2$ (0.00%). Allele frequencies were within the Hardy-Weinberg equilibrium expectations ($P > 0.05$) in both patients and controls. Neither the $\varepsilon 2$ nor the $\varepsilon 4$ carrier status was associated with hypertension (OR = 0.68, 95%CI = 0.41-1.13, p=0.14 and 1.23, 0.84-1.79, p=0.29 respectively).
This study provides epidemiologic evidence that the ApoE genotype is not associated with EH in Bulgarian population.

P3.28
CENTRAL VS. PERIPHERAL AND STEADY VS. PULSATILE BLOOD PRESSURE COMPONENTS AS DETERMINANTS OF RETINAL MICRO-VESSEL DIAMETERS

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Objective: We assessed association of retinal micro-vessel diameter with central and peripheral BP.
Methods: We post-processed retinal photographs taken in 514 subjects randomly selected from a Flemish population (mean age, 50.6 years; 50.8% women), using IVAN software to generate retinal arteriolar (CRAE) and venular (CRVE) equivalents. We measured peripheral and central BP by mercury sphygmomanometry and tonometry at the carotid artery (SphygmoCor software), respectively. We applied stepwise regression, considering as covariables in addition to BP sex, age, body mass index, smoking, drinking, antihypertensive drug treatment, and serum cholesterol.
Results: CRAE and CRVE averaged 153μm and 219μm. Effect sizes (ìm) for CRAE for 1−SD increase in peripheral vs. central BP were −3.77 vs. −3.52 systolic, −3.16 vs. −3.13 diastolic, −3.84 vs. −3.64 for mean BP, and −2.07 vs. −1.83 for pulse pressure ($P \leq 0.006$). Models that included two BP components demonstrated that CRAE decreased ($P \leq 0.035$) with systolic (peripheral vs. central, −2.87 vs. −2.40) and diastolic (−1.58 vs. −1.80) BP. CRAE decreased with mean BP (−3.53 vs. −3.53; $P < 0.0001$), but not with pulse pressure ($P \geq 0.19$). CRVE was not related to any peripheral or central BP component ($P \geq 0.062$). The variance inflation factor in these models was <2.0. The multivariable-adjusted slopes of CRAE on BP components were similar for centrally and peripherally measured BP ($p \geq 0.28$).
Conclusion: Higher systolic and mean BP is associated with smaller CRAE, irrespective of whether BP is measured centrally or peripherally. Central BP does not refine the inverse association of CRAE and CRVE with peripheral BP.

P3.29
ASSESSMENT OF THE DETERMINANTS OF LOCAL CAROTID STIFFNESS IN A GENERAL POPULATION IN NORTHERN ITALY

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Background: The determinants of aortic stiffness have been elucidated in several studies, while few data are available for carotid stiffness. Aim of the study was to identify the main determinants of carotid arterial stiffness parameters in a general population in Northern-Italy(Vobarno Study).
Methods:183subjects(61% female, mean age 55± 4,53% hypertensives,59% treated) underwent laboratory examinations and both clinic and 24 hours BP measurement (Spacelabs 90207). A non-invasive echotracking system was used to measure intima-media thickness, diameter, distension, distensibility (Dist), distensibility coefficient (CDist), compliance coefficient (CC) and elastic modulus (Einc) on 4-cm long common carotid artery segment.
Results: correlation coefficient of Dist, CDist and Einc are shown in Table 1.

	Dist		CDist		Einc	
	R	*p*	r	*p*	r	*p*
Age (years)	−0.240*	0.001	-0.241*	0.001	0.210*	0.005
BMI (Kg/m2)	−0.192*	0.01	-0.192*	0.010	0.169*	0.024
Clinic SBP (mmHg)	−0.501*	0.001	-0.477*	0.000	0.511*	0.000
Clinic DBP (mmHg)	−0.181*	0.015	-0.184*	0.014	0.262*	0.000
Clinic MBP (mmHg)	−0.374*	0.001	-0.362*	0.000	0.422*	0.000
24 hours SBP (mmHg)	−0.207*	0.006	-0.198*	0.009	0.222*	0.003
24 hours DBP (mmHg)	−0.183*	0.016	-0.191*	0.012	0.207*	0.006
24 hours MBP(mmHg)	−0.13	0.094	-0.125	0.099	0.166*	0.029

At multivariate analysis the independent predictor of Dist,CDist and Einc were age (β=-0.22, β=-0.22 and β=0.18, respectively, all $p<0.01$), BMI (β=-0.18, β=-0.18 and β=0.14, respectively, all $p<0.05$),MBP (β=-0.34, β=-0.33 and β=0.40, respectively, all $p<0.001$)and female gender(β=0.19,β=0.18 and β=-0.15,respectively,all $p<0.05$).When carotid arterial stiffness parameters were compared in males and females,a significantly lower values of Dist and CC were observed in females (365±97 vs 427±124 μm,$p<0.001$ and 0.63±0.24 vs 0.83±0.29 mm^2/kPa^{-1},$p<0.001$, respectively).After adjusting for possible confounders in a multivariate model distension(345 vs 456 μm, $p<0.001$),CDist (23.4 vs 30.3 $kPa^{-1}\cdot 10^{-3}$, $p<0.001$) and CC (0.61 vs 0.87 mm^2/kPa^{-1}, $p<0.001$)were significantly lower in females while Einc was significantly higher in females(0.45 vs 0.34 $kPa\cdot 10^3$,p=0.007).Conclusion: in a general population sample age, female gender, BMI and clinic and 24 hours BP values are associated to an increase local carotid stiffness.

P3.30
DIFFERENCE IN THE PREVALENCE OF HYPERTENSION USING STANDARD BLOOD PRESSURE MEASUREMENT COMPARED TO AMBULATORY BLOOD PRESSURE MONITORING IN KILIFI, KENYA

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Background: As sub Saharan Africa (sSA) goes through demographic and epidemiological transition, accurate data on disease prevalence are required to guide allocation of scarce health resources between declining but still important infectious disease and emerging chronic conditions such as hypertension. We conducted a study to determine the difference in the prevalence of hypertension as diagnosed using standard blood pressure measurement (SBP) compared to 24-hour ambulatory monitoring (ABPM).
Methods: We randomly selected an age-stratified sample of 700 adults (18-90 years) living within the Kilifi Health and Demographic Surveillance System (KHDSS) in Kenya (adult population ~125,000). All participants underwent SBP by WHO recommended methods (mean of last 2 from 3 sequential readings); those with an average SBP ≥140/90 mmHg underwent ABPM.