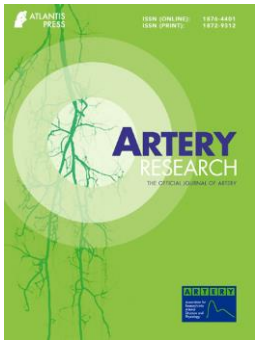

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P34: DETERMINANTS OF PERIPHERAL WAVE REFLECTION IN A LARGE TREATED HYPERTENSIVE POPULATION

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blood volume ejected by the ventricle into the aorta up to time of peak pressure and blood flow into the aorta (corresponding to the rate of ventricular ejection) up to this point. Increased flow and volume accounted for 20.1 mmHg (52%) of the 39.0 mmHg difference in PP between the upper and lower tertiles of the hypertensive subjects 1.

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Poster Session I — Hypertension II

P34

DETERMINANTS OF PERIPHERAL WAVE REFLECTION IN A LARGE TREATED HYPERTENSIVE POPULATION

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Objective: To evaluate the determinants of the peripherial wave reflection measured by the second derivative of the fingertip photoplethysmogram (SDPTG) among known cardiovascular (CV) risk factors in a large treated hypertensive population.
Population and Methods: We studied prospectively 316 hypertensive patients under treatment (154 male, mean age 54 yrs) by SDPTG automatically recorded from the second digit of the right hand (Fukuda FCP-3166®). The SDPTG waveform consisted of a, b, c and d waves in systole and e wave in diastole. The heights of the a, b and d waves were measured from the baseline, and d/a and b/a ratio were calculated. Augmentation index (AUI) was defined as the ratio of the height of the late systolic peak to that of the early systolic peak; SDPTG aging index (AGI) was calculated as (b-c-d-e)/a. The CV risk factors analized were systolic (SBP) and diastolic (DBP) blood pressure, heart rate (HR), left ventricule mass index (LVMI), creatinine, glycemia, cholesterol, triglycerides and body mass index (BMI).
Results: In the multivariate analysis the most signicative associations were: AGI: age (+, $p<0{,}001$) and SBP (+, $p < 0{,}05$); b/a: age(+, $p < 0{,}001$), SBP(+, $p < 0{,}01$) and HR(-, $p < 0{,}01$); , d/a: BP (- , $p < 0{,}01$); AUI:SBP(+, $p < 0{,}001$), HR(-, $p < 0{,}001$) and BMI(- , $p < 0{,}01$). When compared according BP control (<140/90 mmHg), AUI, b/a and d/a ratio were significantly higher in the patients whose BP was not controlled.
Conclusion: In treated hypertensives, changes in vascular wave reflection and stiffness were influenced by age, HR, and blood pressure control, most importantly SBP.

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ARTERIAL STIFFNESS AND CHRONIC STRESS: ROLE OF GENDER — RIGIDITÀ ARTERIOSA E STRESS CRONICO: RUOLO DEL GENERE

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Aim: Evaluate whether exposure to chronic stress is associated with early vascular aging in hypertensive patients and possible gender differences in this relationship.
Methods: Patients where recruited in a Hypertension outpatient clinic during a visit for the evaluation of subclinical organ damage. Aortic stiffness was measured as carotid-femoral pulse wave velocity (PWV) by applanation tonometry; common carotid intima-media thickness (IMT) and distensibility were evaluated by automated analysis of carotid ultrasound clips. Chronic stress was assessed using three different standardized scales: Perceived Stress Score 4 (PSS4), Depression Anxiety Stress Scale (DASS) and Chronic Stress Burden (CSB).
Results: Data from 125 patients (age 56.7 $\pm$ 12.5years) were analyzed. No significant differences were found between men and women in terms of PWV [8.90 (1.9) vs 8.55 (1.8) m/s, $p = 0.14$], carotid distensibility (22.34 $\pm$ 8.79 vs 21.17$\pm$8.74 kPa^{-1}, $p = 0.545$) and IMT (0.74 $\pm$ 0.12 vs 0.70 $\pm$ 0.13 mm, $p = 0.132$). Women presented significantly higher scores of PSS4 (7(3) vs 5(3), $p = 0.007$) and CSB (1.42 $\pm$ 1.24 vs 0.59 $\pm$ 0.85, $p = 0.004$). In the linear multiple regression analysis, CBS was correlated with PWV in the general population (beta = 0.37, $p = 0.050$) being responsible for 4% of the variance of PWV, without significant gender differences. Among the components of CBS, difficulties in relationships with someone close to the participant were associated with increased PWV only in women ($p=0.01$). In a multiple regression model, this variable tended to be an independent predictor of PWV (beta = 0.37, $p = 0.057$), responsible for 7% of the PWV variance.
Conclusions: In hypertensive patients, chronic stress burden is associated with greater arterial stiffness; in particular, stress related to difficulties in relationships seems to be associated with greater vascular stiffness only in women.

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PULSE WAVE VELOCITY (PWV) RESPONSES TO 3 MONTHS OF YOGA POSES AND RESPIRATORY CONTROL (UJJAYI PRANAYAMA) IN HYPERTENSIVE POST MENOPAUSE WOMEN: RANDOMIZED CLINICAL TRIAL

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Background: Non-pharmacological management of hypertension includes regular exercises. Yoga has been pointed as effective on treatment of hypertension. Its many aspects like yoga poses (asanas), respiratory control (pranayamas), meditation and others have not yet been assessed separately to understant its effects on cardiovascular issues. Thus, this study aims to partially clear the effects of yoga poses including exclusive muscle contraction known as bandhas (pelvic floor, core and throat), a specific respiratory technique ujjayi pranayama, whose translation is victory breath and active control group composed of stretching exercises on PWV.
Methods: Randomized trial assessing carotid femoral pulse wave velocity (cfPWV) by Complior®. Hypertensive post menopause women (HPMW) non-obese and non-smokers randomized in 4 groups (1- yoga poses + ujjayi; 2- yoga poses, 3- stretching exercises + ujjayi, 4- stretching exercises) attending 60 minutes assisted video classes twice a week (24 sessions). Data are presented as mean(M) $\pm$ standard error (SE). Generalized estimation equation (GEE) was used to data analysis, $p \leq 0{,}05$.
Results: 24 women recruited, randomized, 15 concluded study (1- n=3; 2- n=6; 3- n=4; 4- n=2). Group 1 showed cfPWV at 10, 0 $\pm$ 0, 23 m/s; 2- 8,9 $\pm$ 0,29 m/s; 3- 7.7 $\pm$ 0,53 m/s; 4- 8.8 $\pm$ 0,24 m/s at baseline. Post intervention presented 1- -1,8 $\pm$ 0,31 m/s $p = 0{,}00$; 2- -0,43 $\pm$ 0,25 m/s $p = 0{,}08$; 3- -1,4 $\pm$ 0,27 m/s $p = 0{,}00$; 4- 1,4 $\pm$ 0,99 m/s $p = 0{,}16$.
Conclusion: The present study has demonstrated an effect of respiratory control ujjayi pranayama on cfPWV after 3 months in HPMW.

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PULSE WAVE VELOCITY: DEPENDENCE ON CONTEMPORANEOUS AND HISTORICAL BLOOD PRESSURE COMPONENTS

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Background: Arterial stiffness as measured by PWV along the aorta is an important determinant of cardiovascular risk. PWV is known to be dependent on contemporaneous blood pressure (BP) but its dependence on long-term BP has not been established.
Methods: Subjects from Twins UK who had tonometric measures of carotid-femoral PWV with previous longitudinal measures of blood pressure (n = 2094) and, in a sub-sample, PWV (n=956) were studied. Brachial artery pulse pressure (PP) and mean arterial pressure (MAP) were averaged over the period of longitudinal follow-up to obtain measures of historical PP and MAP (PPH and MAPH). The relationship of PWV to contemporaneous PP and MAP (PPC and MAPC) was compared with that to PPH and MAPH.
Results: The average duration of blood pressure measurement was 14.0 $\pm$ 4.3 years.PWV correlated strongly with PPC ($r = 0.542$, $p < 0.001$), PP_H ($r = 0.474$,$p < 0.001$), MAP_C ($r = 0.462$, $p < 0.001$) and MAP_H ($r = 0.360$, $p < 0.001$). In multiple regression analysis incorporating