



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantis-press.com/journals/artres>

P4.17: ARTERIAL STIFFNESS IN YOUNG PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

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To cite this article: Mariella Catalano*, Giovanni Scandale, Gabriel Dimitrov, Marzio Minola, Martino Recchia, Francesca Galli, Gianni Carzaniga, Maria Carotta (2015) P4.17: ARTERIAL STIFFNESS IN YOUNG PATIENTS WITH PERIPHERAL ARTERIAL DISEASE, Artery Research 12:C, 19–19, DOI: <https://doi.org/10.1016/j.artres.2015.10.261>

To link to this article: <https://doi.org/10.1016/j.artres.2015.10.261>

Published online: 7 December 2019

P4.15 BLOOD PRESSURE, BODY MASS INDEX AND ARTERIAL ELASTIC PROPERTIES IN YOUNG PEOPLE

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Pulse wave velocity (PWV) is widely used for arterial stiffness assessment. Increased arterial stiffness is a predictor of cardiovascular risk in adults. There are limited data on PWV and its determinants in young people. Study was performed to compare PWV and its association with blood pressure (BP) and body mass index (BMI) in healthy high school and university students.

Methods: First group – 42 high school students (22 males) 14-15 years (14.8 ± 0.3 years), the second group – 38 university students (18 males) aged 17-21 years (18.8 ± 1.1 years). To study velocities in elastic (Ve) and muscular (Vm) arteries sphygmomanometry was performed on carotid, femoral and radial arteries. **Results:** Older students had higher BMI 22.2 ± 2.8 vs 20.06 ± 2.05 kg/m²; $p=0.002$ and trend to higher systolic BP (126.2 ± 16.6 vs 119.6 ± 10.2 mm Hg; $p=0.07$). No difference between groups in Vm was found (7.28 ± 1.18 m/s in 1st group; 7.09 ± 1.14 m/s in 2nd). Ve was higher in older group (6.24 ± 1.06 vs 5.57 ± 0.67 m/s in younger group; $p=0.001$). No gender difference was found in Ve or Vm in either group. Correlation analysis performed in both groups revealed that Ve significantly correlated with age ($r=0.26$), BMI ($r=0.34$), systolic ($r=0.29$), diastolic ($r=0.30$) and mean BP ($r=0.33$). Vm correlated only with height ($r=0.28$). Pulse BP did not correlate with Ve or Vm. Multiple regression found only BMI as independent factor associated with Ve ($\beta=0.27$; $p=0.04$).

Conclusions: Elastic arteries stiffness increased with age in young people with no gender difference. It depends on BP and BMI. The main determinant of Ve is BMI.

P4.16 THE MYOTROPHOBLAST OF THE RAT PLACENTA: EX VIVO STUDY OF NITRIC OXIDE SYNTHASE INHIBITION

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Introduction: Endovascular trophoblasts (EvasT) of the rat express smooth muscle (SM) proteins and contract ex vivo upon exposure to endothelin-1 (ET1). Contraction is mediated via ET1 receptors A and B (ETA, ETB). In vascular SM ETB, in variance from ETA, exerts relaxation through activation of nitric oxide synthase (NOS). We investigated the role of NOS expressed by EvasT in reaction to ET1 exposure.

M&M: Cut surface area of remodeled spiral artery rings devoid of SM was measured ex vivo exposed to (a) L-NAME alone, (b) L-NAME and ET1 representing the combined contractile effect of both receptors, and (c) L-NAME with ET1 and ETA antagonist, representing the isolated contractile effect mediated by ETB. These curves were compared with ET1-induced contraction in the presence of receptor antagonists without L-NAME. Statistical analysis was performed 2-way mixed ANOVA.

Results: L-NAME alone reduced lumen cut surface area by $2.2 \pm 0.3\%$ ($p=0.002$). ET1+L-NAME, representing the sum of constrictive effect via ETA and ETB reduced vascular lumen area immediately, compared with a plateau at 60min by addition of ET1 alone, $p=0.004$. ET1 + ETA inhibitor + L-NAME, representing the isolated constrictive effect of ETB ($5.9 \pm 0.6\%$), demonstrated similar vasoconstriction via ETA ($5.3 \pm 0.5\%$) ($p=0.018$).

Conclusions: EvasT of the rat remodeled spiral artery react to ET1 exposure similar to vascular SM of non-modified arteries: contract via ETA and ETB and relax via ETB through NOS activation. This phenomenon may play a role in situations of dysregulation of the vasoactive systems in rat models of pre-eclampsia and IUGR.

P4.17 ARTERIAL STIFFNESS IN YOUNG PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

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Increased arterial stiffness occurs in older patients with peripheral arterial disease (PAD). In this study we compared arterial stiffness and central hemodynamic parameters in young (< 60 years of age) PAD patients and controls. In 31 PAD patients with an ankle-brachial index ($ABI \leq 0.9$) and 42 controls, aortic Pulse wave velocity (aPWV), Augmentation index corrected for heart rate ($AIx@75HR$), aortic Pulse Pressure (aPP), Pulse Pressure Amplification (PPA), were measured using the SphygmoCor device. In young PAD patients aPWV and $AIx@75HR$ were similar ($p=0.10$) ($p=0.58$) With respect to controls but aortic PP was higher ($p=0.02$) and the PP amplification ratio was lower ($p=0.005$). PAD in young subjects is associated with central hemodynamic alterations but not with degenerative stiffness of the large arteries.

P4.18 THE ASSUMPTION THAT BLOOD PRESSURE DECREASES OVER CONSECUTIVE MEASUREMENTS IS FALSE: MAJOR IMPLICATIONS FOR HYPERTENSION DIAGNOSIS AND GUIDELINES

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Background: There is anecdotal belief that clinic blood pressure (BP) drops over consecutive measurements. This has led to guideline recommendations to discard the first BP reading, or take only one reading if systolic BP (SBP) <140 mmHg. However, the magnitude and direction of change in SBP over consecutive measurements is not clear, and the effect of age and BP level on this change in SBP is unknown. We investigated these issues, and their effect on hypertension diagnosis.

Methods: Duplicate BP (or triplicate if large BP differences) was recorded by oscillometry among 20,752 participants (aged 45[95CI; 45,46] years; males 50%) from the 2011-13 Australian Health Survey. SBP change was defined as the difference between measurements.

Results: SBP decreased between the first two measures in only 56%, whereas it increased in 37% and did not change in 7% of the population. There was a strong, age-dependent, J-curved relationship between SBP change and SBP level ($p<0.001$), with the smallest SBP change corresponding to controlled SBP (100 – 140 mmHg). The age-dependent SBP changes resulted in significant diagnostic reclassification compared with the approach of discarding the first reading; 63% and 35% reclassified from hypertension to normal BP, and 4% and 13% reclassified from normal to hypertension among those aged <50 years and ≥ 50 years respectively.

Conclusions: The assumption that SBP drops over consecutive measurements is false, and significant age- and BP-dependent reclassification of hypertension diagnosis will result if the first SBP is discarded. These findings highlight the need for change to some international hypertension guidelines.

P4.19 CARDIOVASCULAR RISK FACTORS AND LEFT VENTRICULAR HYPERTROPHY IN CHILDREN WITH CHRONIC KIDNEY DISEASE

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Cardiovascular diseases are substantial causes of mortality among patients with chronic kidney disease (CKD). The aim of the study was an assessment of the impact of cardiovascular risk factors on left ventricular hypertrophy (LVH) in children with CKD.

Material and methods: The study was conducted in a group of 71 children with mean age 11 years and CKD stage 1 to 5. Serum cystatin C, albumin