



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantispress.com/journals/artres>

MOLECULAR AND CELLULAR CHANGES IN ARTERIAL FUNCTION OVER THE LIFE COURSE – FROM ACCELERATED AGEING TO CALCIFICATION

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To cite this article: Catherine M. Shanahan (2018) MOLECULAR AND CELLULAR CHANGES IN ARTERIAL FUNCTION OVER THE LIFE COURSE – FROM ACCELERATED AGEING TO CALCIFICATION, Artery Research 24:C, 64–64, DOI: <https://doi.org/10.1016/j.artres.2018.10.011>

To link to this article: <https://doi.org/10.1016/j.artres.2018.10.011>

Published online: 7 December 2019

ASSOCIATION OF PULSE WAVE VELOCITY AND BODY MASS INDEX IN HEALTHY MEXICAN POPULATION

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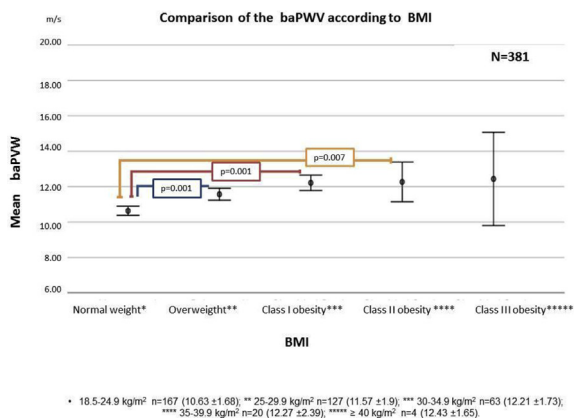
Rational: Cardiovascular diseases represent the main cause of morbidity and mortality throughout the world (1). Arterial stiffness has shown to be an important predictor of cardiovascular events, and pulse wave velocity (PWV) is a marker of subclinical organ damage which can be measured by different methods, one of which is by means of the brachial ankle pulse wave velocity (baPWV) (2–3). On the other hand, obesity affects a large proportion of the population and is classified according to the body mass index (BMI). Increased BMI is associated with hypertension and increased mortality (4).

Objective: Analyse the correlation between baPWV and BMI in healthy subjects.

Methodology: An analytical cross-sectional study was carried out in healthy age 18–70 year old subjects, who attended the INTEC, (192 women, 189 men). BMI was calculated with the formula Weight (kg) /Height (m)², baPWV was measured with the VP1000 plus model BP-203RPE III. Correlations were determined with Spearman's Rho, differences between groups were determined using Anova with post hoc test.

Results: A population of 381 subjects was analyzed, a significant correlation was found between baPWV and BMI ($r = 0.332$, $p = 0.001$). Dividing patients according to the degree of BMI a significant difference was found in the baPWV between normal weight-overweight groups (10.63 ± 1.68 , 11.57 ± 1.9 ($p = 0.001$), normal weight –class I obesity (10.63 ± 1.68 , 12.21 ± 1.73 ($p = 0.001$) and normal weight –class II (10.63 ± 1.68 ; 12.27 ± 2.39 ($p = 0.007$).

Conclusion: A direct correlation between baPWV and the body mass index was found. The greater increase of the baPWV was seen between the groups of normal weight and overweight / Class I obesity/ Class II obesity. Subjects with overweight and grade I obesity represent a group with a significant increase in arterial stiffness which should receive special attention in order to decrease the development of cardiovascular disease.



WHICH IS MORE CORRELATED WITH HYPERTENSIVE ORGAN DAMAGE, SLEEP BLOOD PRESSURE ASSESSED BY SELF-MEASURED AT HOME OR AMBULATORY BLOOD PRESSURE MONITORING?: THE JAPAN MORNING SURGE-HOME BLOOD PRESSURE (J-HOP) STUDY

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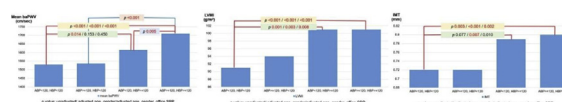
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Objective: To assess the associations with hypertensive target organ damage (TOD) of sleep SBP assessed by self-measured home blood pressure monitoring (HBPM) and ambulatory blood pressure monitoring (ABPM).

Methods: Data of 1008 participants in the J-HOP study who measured sleep BP using both HBPM, three times during sleep (2 AM, 3 AM and 4 AM) and ABPM during sleep were analyzed. Study participants were classified into 4 groups according to sleep SBP values: group 1, HBPM <120 mmHg, ABPM <120 mmHg; group 2, HBPM <120 mmHg, ABPM ≥120 mmHg; group 3, HBPM ≥120 mmHg, ABPM <120 mmHg and group 4, HBPM ≥120 mmHg, ABPM ≥120 mmHg. Hypertensive TOD as indicated by brachial ankle pulse wave velocity (baPWV), left ventricular mass index (LVMI) and carotid intima media thickness (IMT), assessed in 946, 876 and 317 participants respectively, were compared among the 4 groups.

Results: Mean age was 63 ± 11 years. The percentage of male participants was 49.9. Thirty-four, 10, 20 and 36 percent of the participants were classified into groups 1, 2, 3 and 4. For groups 1, 2, 3 and 4, respectively, baPWV were 1529 ± 293 , 1536 ± 265 , 1616 ± 255 and 1710 ± 322 cm/sec, LVMI were 91 ± 23 , 94 ± 22 , 101 ± 26 and 101 ± 28 g/m², and IMT were 0.73 ± 0.14 , 0.72 ± 0.18 , 0.79 ± 0.15 and 0.80 ± 0.19 mm. After age, gender and office SBP were adjusted, the baPWV, LVMI and IMT of groups 3 and 4 were significantly higher than of group 1. In multivariate analyses, sleep SBP assessed by HBPM was an independent predictor of baPWV, LVMI and IMT, but that assessed by ABPM was an independent predictor of only baPWV.

Conclusions: Sleep SBP measured by HBPM was more closely associated with baPWV, LVMI and IMT than sleep SBP measured by ABPM.



Special guest lecture

MOLECULAR AND CELLULAR CHANGES IN ARTERIAL FUNCTION OVER THE LIFE COURSE – FROM ACCELERATED AGEING TO CALCIFICATION

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Vascular stiffening and calcification are hallmarks of ageing and these pathologies are accelerated in patients with diabetes and renal failure. Emerging evidence has defined a role for nuclear lamina defects and the DNA damage response in driving vascular calcification. The mechanisms responsible are linked to the onset of cellular senescence and the activation of the proinflammatory senescence associated secretory phenotype (SASP) in vascular smooth muscle cells (VSMCs). In response to the SASP VSMCs can undergo phenotypic modulation and upregulate expression of proteins normally confined to cells of the osteo/chondrogenic lineage. Understanding the signaling pathways that drive this response is essential for defining novel therapeutic pathways to tackle age-associated vascular pathologies. We have been investigating the role of a number of signaling pathways involved in the DNA damage response as key drivers of calcification and VSMC osteo/chondrogenic differentiation including both the ataxia telangiectasia mutated (ATM) and poly(ADP) ribose (PARP) pathways. In addition it is clear that epigenetic changes, induced by nuclear lamina defects, precede the onset of calcification in both the aged vasculature and in patients with renal failure.

Young investigator session

NOVEL RESEARCH FUNDING OPPORTUNITIES

Warwick Anderson
Human Frontier Science Program, France

It is a fortunate paradox that research motivated simply by a wish to better understand the natural world can later result in the most powerful applications imaginable. By definition, the outcome of any research is unknown until the research is finished. The outcomes are even less predictable at the frontiers of knowledge but the rewards can be commensurately greater. Internationally, there has been increased funding of more "mission-focused" and translational research during the last decade. This is to be applauded and is yielding strong dividends for the public funds invested. But frontier basic science, where the most creative and talented researchers work on the ideas and hypotheses that they believe are the most important, is a long-term investment in the future. It is still the major engine for progress in science, industry and society. Frontier basic life science research is the domain of the Human Frontier Science Program. The Program was created as