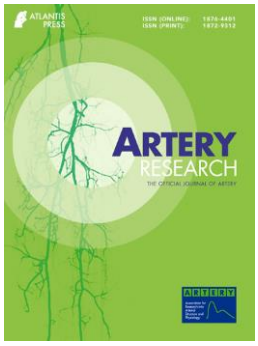

Artery Research

ISSN (Online): 1876-4401 **ISSN (Print): 1872-9312**
Journal Home Page: https://www.atlantis-press.com/journals/artres

P2.18: STUDY OF THE DETERMINANTS OF PWV MEASURED BY ARTERIOGRAPH AND SPHYGMOCOR AND THE DETERMINANTS OF DISCREPANCIES

M.A. Alivon, E.B. Bozec, S.L. Laurent, P.B. Boutouyrie

To cite this article: M.A. Alivon, E.B. Bozec, S.L. Laurent, P.B. Boutouyrie (2012) P2.18: STUDY OF THE DETERMINANTS OF PWV MEASURED BY ARTERIOGRAPH AND SPHYGMOCOR AND THE DETERMINANTS OF DISCREPANCIES, Artery Research6:4, 169–169, DOI: https://doi.org/10.1016/j.artres.2012.09.099

To link to this article: https://doi.org/10.1016/j.artres.2012.09.099

Published online: 21 December 2019

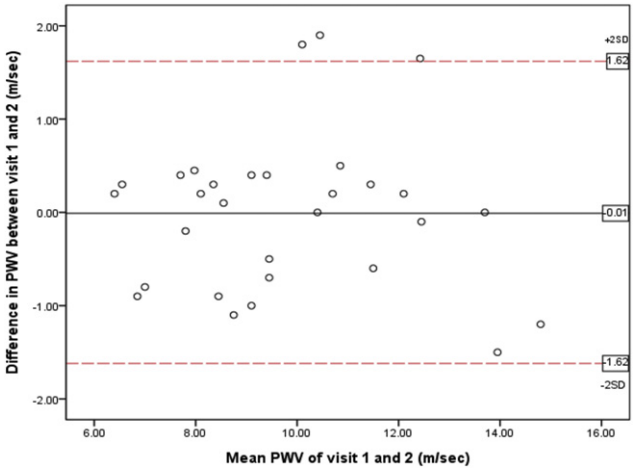

Figure 1 Bland and Altman plot showing between days difference in Pulse Wave Velocity (PWV) in patients with COPD.

P2.18

STUDY OF THE DETERMINANTS OF PWV MEASURED BY ARTERIOGRAPH AND SPHYGMOCOR AND THE DETERMINANTS OF DISCREPANCIES

M. A. Alivon, E. B. Bozec, S. L. Laurent, P. B. Boutouyrie
Inserm U970-Hôpital Européen Geroges Pompidou, Paris, France

Introduction: Large artery stiffness is recognized as a strong, independent marker of cardiovascular risk, mainly through aortic pulse wave velocity (PWV). Arteriograph is a non-invasive oscillometric method, which estimates aortic PWV through brachial pressure wave analysis.
Aim: To compare the determinants of PWV measured with Arteriograph (Ar PWV) to carotid-femoral PWV (CF PWV) determinants and to study the determinants of discrepancies.
Methods: CF PWV was assessed by applanation tonometry (SphygmoCor®) and Ar PWV was assessed by Arteriograph. Multivariate analysis and stepwise regression was performed to study the determinants and Pearson's coefficient to study correlations.
Results: 90 subjects were included: 30 healthy subjects and 60 patients with essential hypertension. The correlation between Ar PWV and CF PWV is good ($r=0.77$; $p<0.001$). Determinants of CF PWV are arterial blood pressure and age as expected. Determinants of Ar PWV are unusual: jugulum-pubic symphysis distance, diabetes status and gender ($R^2=0.15$; 0.19 and 0.09 respectively). Concerning determinants of discrepancies of PWV we found again jugulum-pubic symphysis distance and gender ($R^2=0.08$; 0.14 respectively). And for determinants of discrepancies of the time delay (Δt): carotid stiffness parameters ($R^2=0.15$) and wave reflexions ($R^2=0.10$)
Conclusion: Arteriograph is well correlated with CF PWV but determinants of Ar PWV and CF PWV are different, Arteriograph seems to be sensitive to metabolic factors. Adjustments may have to be done in further studies.

P2.19

NON-INVASIVE ASSESSMENT OF CAROTID-FEMORAL PULSE WAVE VELOCITY. DOES THE MEASUREMENT SIDE MATTER?

J. Bossuyt [1], S. Van de Velde [1], S. Vermeersch [1,2], D. Devos [3], C. Heyse [3], J. Filipovsky [4], P. Segers [2], L. M. Van Bortel [1]
[1]*Heymans Institute of Pharmacology, Ghent University, Ghent, Belgium*
[2]*Institute Biomedical Technology, bioMMeda, Ghent University, Ghent, Belgium*
[3]*Dept. of Radiology and Magnetic Resonance Imaging, Ghent University Hospital, Ghent, Belgium*
[4]*Faculty of Medicine in Pilsen, Charles University, Pilsen, Czech Republic*

Recently an expert consensus group advised to measure carotid-femoral (cf) pulse wave velocity (PWV) on the right side of the body, using 80% of the distance between the carotid and femoral measurement site measured with a tape (80% rule). The present study investigated the real travelled cf path lengths at the left and right body side and compared the tape measure distance with the straight distance as obtained using an anthropometer.
Real travelled cf path lengths were measured with MRI in 98 healthy subjects (49 men, age 21-76 years). Path lengths from the aortic arch to the carotid (AA-CA) and femoral (AA-FA) sites were determined. The real travelled path length was calculated as (AA-FA)-(AA-CA). Straight distances between carotid and femoral sites were derived from the MRI images.
The real travelled cf path was slightly longer [11 mm (12), $p<0.001$] at the right side compared to the left. The proposed 80% rule overestimated real travelled cf path lengths with 0.5% at the right and 2.7% at the left side. Straight distance resembled more closely the real travelled distance (Right: 0.2 %, Left: 2.0 %), although not significantly different from tape measure ($p=0.085$).
The travelled cf path is slightly longer at the right than at the left body side. The present study supports the advice of the expert consensus group to preferentially measure cf-PWV at the right body side and suggests that the highest level of accuracy may be obtained using the straight distance, which supports the use of an anthropometer.

P2.20

NON-INVASIVE ESTIMATES OF CENTRAL SYSTOLIC BLOOD PRESSURE: COMPARISON OF THE CENTRON CBP301 AND SPHYGMOCOR DEVICES

L. M. Day [1], A. Mekhail [2], A. K. Goodhart [1], I. B. Wilkinson [1], C. M. McEniery [1]
[1]*University Of Cambridge, Cambridge, United Kingdom*
[2]*Otago University, Otago, New Zealand*

Background: Central systolic blood pressure (cSBP) may be more predictive of cardiovascular events than brachial BP. Therefore, non-invasive methods of determining central BP, which are suitable for routine clinical use, are required. The aim of this study was to compare estimates of cSBP provided by the Centron cBP301 with those obtained with the widely used SphygmoCor system.
Methods: In 60 subjects (30 females), age range 22-90 years, brachial BP was measured using the Centron device and then cSBP estimated using the Centron, and then SphygmoCor. In a subset of 16 subjects (8 females), measurements were repeated at rest and following the administration of glyceryl trinitrate (GTN).
Results: There was a strong correlation ($r=0.98$; $P<0.001$) between the estimates of cSBP obtained with each device. There was also good agreement between devices, with a mean difference ($\pm$SD) of 0.2 ± 3.5mmHg ($P=0.5$). Similarly, the devices were highly correlated and in good agreement following the administration of GTN, with the mean difference in cSBP ranging from 0.5 ± 3.9mmHg to 2.3 ± 3.7mmHg, across the measurement period.
Conclusion: The Centron cBP301 and SphygmoCor devices produce similar estimates of cSBP, both at rest and in response to a pharmacological challenge. The Centron device is potentially suitable for routine clinical monitoring of central BP.

P2.21

AORTIC AND CAROTID PWV ASSESSMENT: A MULTI-TECHNIQUE APPROACH

N. Di Lascio [1], D. De Marchi [2], E. Bianchini [1], V. Gemignani [1], R. M. Bruno [1], G. Giovannetti [1], V. Hartwig [1], F. Faita [1]
[1]*Institute of Clinical Physiology, National Council of Research, Pisa, Italy*
[2]*Fondazione G. Monasterio CNR, Regione Toscana, Pisa, Italy*

Arterial stiffness plays an important role in the development of cardiovascular diseases and is increasingly used in clinical practice as a biomarker of disease's progression. Pulse wave velocity (PWV) is considered a state of the art surrogate marker for arterial stiffness assessment. Aim of this study was to compare regional and local (aortic and carotid) PWV values obtained with different techniques and to test feasibility of creating a dataset with these non-invasive PWV measurements.
Eight young healthy subjects (31.2 ± 7.9 years, 50% males, BMI 23.1 ± 3.3 kg/m^2) have been recruited. For each subject carotid-femoral PWV (cfPWV) measurements were obtained by applanation tonometry while carotid stiffness (CS) values were calculated from common carotid ultrasound images analysed by contour tracking techniques and Bramwhell-Hill equation; carotid pressures measurements were estimated by local applanation tonometry. Two different sequences (at aortic and carotid level) of velocity-encoded MRI images were acquired for each subject: local aortic and carotid PWV (aPWV and cPWV respectively) values were calculated from these images using QA method.