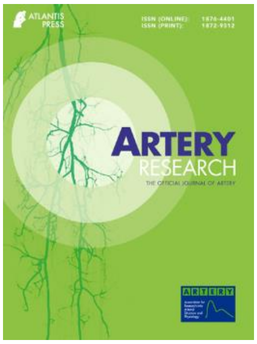

Artery Research

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

P1.02: ABDOMINAL AORTIC CALCIFICATION DETECTION USING DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA): COMPARISON WITH COMPUTED TOMOGRAPHY (CT)

M. Cecelja, M.L. Frost, T. Spector, P. Chowienczyk

To cite this article: M. Cecelja, M.L. Frost, T. Spector, P. Chowienczyk (2009) P1.02: ABDOMINAL AORTIC CALCIFICATION DETECTION USING DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA): COMPARISON WITH COMPUTED TOMOGRAPHY (CT), Artery Research 3:4, 161–161, DOI: https://doi.org/10.1016/j.artres.2009.10.005

To link to this article: https://doi.org/10.1016/j.artres.2009.10.005

Published online: 14 December 2019

Artery Research (2009) **3**, 161—169

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/artres

Poster Presentation Abstracts
Methodological Aspects 1

P1.01
PULSE WAVE VELOCITY: HOW TO ASSESS THE DISTANCE?

D. Mahieu [1], D. Devos [1], J. Kips [2], E. Achten [1], P. Segers [2], L. Van Bortel [1]
[1]*University Hospital, Ghent, Belgium*
[2]*Ghent University, Ghent, Belgium*

Objective: Pulse wave velocity (PWV) is accepted as the standard technique to assess aortic stiffness. While the carotid-femoral transit time can be assessed with high accuracy, the measurement of the aortic length is, however, less accurate. Several approaches for measuring aortic length over the body-surface exist, all of which are measured with a tape measure, hence introducing errors over the curved body surface.
Design and method: We compared eight different body-surface distances with the aortic path length as determined from Magnetic Resonance (MR)-images. 12 healthy volunteers (aged 23 to 39 years) were imaged from carotid to femoral artery. Body surface measurements were done with an antropometer and tape measure. Aortic path length along the luminal centreline was determined from MR-images using custom built Matlab-based software.

Results: Only two body surface measurements were close to the MR-derived aortic path length. Total distance between carotid and femoral artery minus the distance between carotid artery and sternal notch was 2.1 ± 3.7 cm (5.3 ± 8.9 %) larger than the MR-derived aortic path length. The distance between the suprasternal notch and the femoral artery minus the distance between the carotid artery and the suprasternal notch was 1.1 ± 2.7 cm (2.4 ± 6.0 %) smaller than the MR-derived aortic path length.
Conclusions: For assessment of PWV, aortic length can be estimated by the total distance between carotid and femoral artery minus the distance between carotid artery and sternal notch or by the distance between the suprasternal notch and the femoral artery minus the distance between the carotid artery and the suprasternal notch.

P1.02
ABDOMINAL AORTIC CALCIFICATION DETECTION USING DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA): COMPARISON WITH COMPUTED TOMOGRAPHY (CT)

M. Cecelja, M. L. Frost, T. Spector, P. Chowienczyk
King's College London, London, United Kingdom

Background: Abdominal aortic calcification (AAC) is an independent determinant of cardiovascular events. Computed tomography (CT) is currently the gold standard for measuring aortic calcification but is limited by relatively high radiation exposure. Lateral dual-energy X-ray absorptiometry (lateral-DXA) has the potential to detect AAC at a fraction of the radiation dose.
Objectives: To evaluate the potential for lateral DXA scans to detect AAC in comparison to CT in healthy post menopausal women.
Methods: Thirty-four women from the TwinsUK registry aged 50-75 years underwent a non-contrast CT and lateral DXA scan of the abdominal aorta from vertebrae L1 to L4. Presence of calcium was scored using the Agatston method for CT, where a weighting factor is assigned to the calcified region based on the x-ray attenuation and multiplied by the area of the calcified region. Lateral DXA images were scored using a previously validated semi-quantitative 24 point score, where the anterior and posterior aortic walls were divided into 4 lumbar regions and graded 0-3 according to prevalence of AAC.

Results: Calcification (any detectable abdominal calcification) was present in 65% of women as determined by CT and 51% with lateral-DXA. Agreement between CT and lateral DXA scores was good (Spearman's rank correlation coefficient $r = 0.70$, $P < 0.0001$). The sensitivity of lateral DXA scores for detecting AAC was 68% and the specificity 80%.

Conclusion: Lateral DXA imaging provides a useful alternative to CT in detecting AAC with minimal radiation.

P1.03
A COMPARISON OF CENTRAL BLOOD PRESSURES AND AUGMENTATION INDEX ESTIMATED BY OMRON-HEM9000, ARTERIOGRAPH AND SPHYGMOCOR

R. Rezai, G. Goudot, J. Finn, C. Winters, F. Wu, J. K. Cruickshank
University of Manchester, Manchester, United Kingdom

Aims: To compare central systolic blood pressure (cSBP) and augmentation index (AIx) from 2 recently introduced devices Omron-HEM9000 (OM) and Arteriograph (AG) not using a transfer function with that of the widely used SphygmoCor (SC), which together with another radial device OM is calibrated on *brachial* BP.
Methods: Random-order manufacturer-recommended measurements using SC and OM (radial tonometry variants) and AG were taken on the left arm in 35 men (54 ± 10 yr) after >5 mins supine rest. Results are means ±SD, or (95%CI of difference) for paired t-tests.
Results: cSBP by OM is slightly higher than by AG (4(1-7) mmHg, $p = 0.01$). Both OM and AG estimate cSBP significantly higher than SC: 13(10-15) and 9(4-12) mmHg, respectively ($p < 0.001$).

Late systolic shoulder of the radial pulse wave form measured by OM agreed with SC's cSBP (SC-OM: 2(0-4) mmHg, $p = 0.06$), but not with AG's cSBP (AG-OM: 10(7-14) mmHg, $p < 0.001$).

Radial AIx from SC and OM slightly disagree (SC-OM: 3(1-5)%, $p = 0.013$) and both show close correlation ($r = 0.8$) with AG's *brachial* AIx. Aortic AIx by AG was lower than SC's aortic AIx (8(6-10)%, $p < 0.001$) but closely correlated ($r = 0.9$).

Conclusion: Clinically significant higher cSBP values measured by two new methods AG and OM add to previous data suggesting that SC might be underestimating cSBP. Invasive studies involving all 3 devices across a wide age & BP range are needed.

P1.04
INVASIVE ASSESSMENT OF AORTIC PRESSURE WAVES: COMPARISON BETWEEN PRESSURE WIRE AND FLUID FILLED CATHETER

S. Wassertheurer [1], B. Hametner [1], C. C. Mayer [1], B. Eber [2], T. Weber [2]
[1]*Austrian Research Centers, Vienna, Austria*
[2]*Klinikum Wels-Grieskirchen, Wels, Austria*

Introduction: Parameters of wave reflection (augmentation pressure - AP or augmentation index — AIx) are powerful independent prognostic markers in patients with coronary artery disease. However, the invasive investigation of arterial waveforms is still confined to expensive equipment. The aim of this

1872-9312/$ — see front matter
doi:10.1016/j.artres.2009.10.003