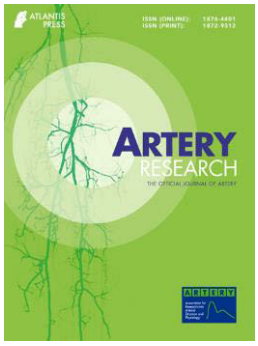

Artery Research

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

06.08: RELATIONSHIP BETWEEN PULSE WAVE VELOCITY AND DIFFERENT BLOOD PRESSURE PATTERNS: THE VOBARNO STUDY

A. Paini, M.L. Muiesan, M. Salvetti, C. Corbellini, E. Belotti, G. Galbassini, C. Agabiti-Rosei, C. Aggiusti, L. Micheletti, V. Paderno, E. Agabiti-Rosei

To cite this article: A. Paini, M.L. Muiesan, M. Salvetti, C. Corbellini, E. Belotti, G. Galbassini, C. Agabiti-Rosei, C. Aggiusti, L. Micheletti, V. Paderno, E. Agabiti-Rosei (2007) 06.08: RELATIONSHIP BETWEEN PULSE WAVE VELOCITY AND DIFFERENT BLOOD PRESSURE PATTERNS: THE VOBARNO STUDY, Artery Research 1:2, 51–51, DOI: https://doi.org/10.1016/j.artres.2007.07.053

To link to this article: https://doi.org/10.1016/j.artres.2007.07.053

Published online: 21 December 2019

06.05
AORTIC STIFFNESS AND LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

R. Sabit [1], C.E. Bolton [1], J.M. Edwards [2], A.G. Fraser [2], D.J. Shale [1], J.R. Cockcroft [2]. *[1]Department of Respiratory Medicine, Llandough Hospital, Cardiff University, Penarth, United Kingdom, [2]Department of Cardiology, Cardiff University, Cardiff, United Kingdom*

Background: Patients with COPD have increased aortic stiffness which may contribute to the excess cardiovascular risk in this group. Increased aortic stiffness increases left ventricular (LV) afterload and may contribute to impaired LV relaxation and diastolic dysfunction. We investigated LV diastolic function and its relationship to aortic stiffness in patients with COPD.
Methods: 36 COPD patients (19 male) and 14 age and gender matched healthy smokers (HS), both groups free of cardiovascular disease, were studied at clinical stability. The degree of airways obstruction was assessed using spirometry. Measures of LV diastolic function — mitral E/A, isovolumetric relaxation time (IVRT) and E/Ea were determined using echocardiography with myocardial velocity imaging. Aortic pulse wave velocity (APWV) was determined as a measure aortic stiffness using the Sphygmocor system.
Results: Patients, mean (SD) age 66.5(8.9) years exhibited airways obstruction across a wide spectrum of severity. Patients had a longer mean (SD) IVRT, 125(15.2) ms, compared with HS, 98.2(21.1) ms, $p<0.01$. E/Ea was also greater in patients than controls ($p<0.01$), while mitral E/A was similar between groups. APWV was higher in patients (11.5(2.9) m/s) than HS (9.45(1.3) m/s), $p<0.001$. In patients APWV was related to E/E_A ($r=0.55$, $p<0.01$), mitral E/A ($r=-0.38$, $p<0.05$) and IVRT ($r=-0.46$, $p<0.01$). APWV was the only significant predictor of IVRT in a mf aortic PWV may be useful in the assessment of LV diastolic dysfunction.y with myocardial velocity imaging. VIVionultiple regression analysis that included age and mean arterial pressure (r sq=0.22).
Conclusions: COPD patients have LV diastolic dysfunction which is related to aortic stiffness. Aortic PWV may be a useful marker of LV diastolic function in patients with COPD.

06.06
ARTERIAL STIFFNESS AND ENLARGEMENT IN MILD TO MODERATE CHRONIC RENAL FAILURE: ROLE OF VITAMIN D

M. Briet [1], P. Houillier [2], M. Froissart [2], E. Bozec [1], C. Gaucci [2], C. Collin [1], S. Laurent [1], P. Boutouyrie [1]. *[1]Assistance Publique Hôpitaux de Paris, Hôpital Européen Georges Pompidou, Department of Pharmacology, Paris, France, [2]Assistance Publique Hôpitaux de Paris, Hôpital Européen Georges Pompidou, Department of Physiology, Paris, France*

Background: Chronic kidney disease (CKD) is associated with arterial abnormalities characterized by an increase in arterial stiffness and an enlargement of carotid artery. Non classical cardiovascular risk factors such as abnormalities of mineral metabolism are associated with an increase risk in cardiovascular disease in end stage renal disease patients. The aim of this cross-sectional study is to evaluate the relationship between arterial phenotype and mineral metabolism parameters, serum parathormone (PTH), 25(OH) vitamin D and $1.25(OH)_2$ vitamin D, in 95 CKD patients (58.4 ± 14.9 years, GFR ^{51}Cr-EDTA 36 ± 16mL/min/1.73m^2).
Methods: Common carotid artery diameter, intima-media thickness, carotid stiffness, Young's elastic modulus were determined with an echotracking system. Aortic stiffness was evaluated by the measurement of carotid-to-femoral pulse wave velocity (Complior^R).
Results: After adjustment for mean blood pressure, age and GFR, 25 (OH) vitamin D level is significantly and negatively correlated with carotid stiffness ($P=0.005$) and Young elastic modulus ($P=0.003$) and explains respectively 4.1% and 5.3% of the variance. After adjustment for mean blood pressure, age and GFR, $1.25(OH)_2$ vitamin D level is significantly and positively correlated with carotid diameter ($P=0.002$), with carotid stiffness ($P=0.03$) and young elastic modulus ($P=0.04$). PTH is significantly and negatively correlated with aortic stiffness ($P=0.01$) and explains 3.7% of the variance.
Conclusion: Vitamin D status is associated with an increase in arterial stiffness and enlargement in mild to moderate chronic renal failure, 25 (OH) D3 is associated with favourable arterial phenotype whereas $1.25(OH)_2$ D3 and PTH are associated with adverse arterial phenotype.

06.07
EVALUATION OF A METHOD OF WAVE REFLECTION ASSESSMENT VIA TRIANGULAR FLOW WAVE APPROXIMATION

J.G. Kips [1], E.R. Rietzschel [2], M.L. De Buyzere [2], T.C. Gillebert [2], L.M. Van Bortel [1], P. Segers [3]. *[1]Department of Pharmacology, Ghent University, Ghent, Belgium, [2]Department of Cardiovascular Diseases, Ghent University, Ghent, Belgium, [3]Institute of Biomedical Technology, Ghent University, Ghent, Belgium*

Introduction: Wave reflections affect the aortic pressure and flow wave and play a role in systolic hypertension. Accurate quantification of pressure wave reflection requires separation of pressure in its forward (P_f) and backward (P_b) components, which requires aortic flow measurement. This limitation can be overcome by replacing the unknown flow wave by a triangular estimate of arbitrary amplitude, as recently proposed. We verified this technique using pressure and flow data measured in the Asklepios study (>2500 participants, 35 to 55 years).
Method: Wave separation analysis using measured pressure and flow yielded the reference reflection magnitude ($RM=P_b/P_f$). Then, RM was estimated using three triangular approximations of the flow wave, each with duration equal to the ejection time but with peak at (i) the shoulder point of the pressure wave (F^{tSP}); (ii) 30% of the ejection time (F^{t30}) and (iii) the moment of real peak flow (F^{tQm}).
Results: The correlation between measured and estimated RM's was highly significant ($P<0.001$) but overall disappointingly poor ($R^2=0.21$ to 0.25), the highest correlation coefficient being obtained when using (F^{tQm}). Overall, the approximation overestimated RM_{ref} by 10 to 12%. Interestingly, we found the accuracy of all estimations to depend highly on age ($P<0.001$), with the accuracy improving with age.
Conclusion: In healthy middle-aged subjects, quantification of wave reflection by estimating a triangular flow wave shows limited accuracy, even when timing of the peak is obtained directly from the flow waveform. This seems to imply that the triangular shape may be a too simple waveform approximation in this population.

06.08
RELATIONSHIP BETWEEN PULSE WAVE VELOCITY AND DIFFERENT BLOOD PRESSURE PATTERNS: THE VOBARNO STUDY

A. Paini, M.L. Muiesan, M. Salvetti, C. Corbellini, E. Belotti, G. Galbassini, C. Agabiti-Rosei, C. Aggiusti, L. Micheletti, V. Paderno, E. Agabiti-Rosei. *Internal Medicine, Brescia, Italy*

Aim of this study: Was to assess the relationships between pulse wave velocity and different BP patterns (sustained normotension NT, isolated clinical hypertension ICH, ambulatory hypertension AHT and sustained hypertension HT) in a general population sample.
Design and methods: In 198 untreated subjects (age 55.7 ± 9.5, BMI 25.7 ± 4.0, 46.5% males) participating in our population study PWV was measured. Subjects underwent laboratory examinations and clinic and 24 hours BP measurement. Subjects were divided into subgroups: NT (office BP<140/90 and 24 h BP<125/80 mmHg), ICH (office BP≥140/90 and 24h BP<125/80 mmHg), AHT (office BP<140/90 and 24h BP≥125/80 mmHg) and HT (office BP≥140/90 and 24h BP≥125/80 mmHg).
Results: Patient with ICH and HT were older than NT (58.6 ± 10.2 and 58.1 ± 10.0 vs 52.7 ± 8.2, respectively $p<0.01$). The prevalence of male gender was higher in HT and AHT than NT and ICT (69% and 73% vs 29% and 34% respectively, $p<0.01$). BMI was higher in HT than in NT and ICH (26.9 ± 4.3 vs 24.7 ± 3.7 and 25.9 ± 4.0, respectively, $p<0.01$). PWV was significantly higher in AHT and HT in comparison to NT (11.9 ± 2.4 and 12.3 ± 2.8 vs 10.0 ± 1.6, respectively $p<0.01$); this difference remained statistically significant after adjustment for age, BMI, height, glycemia, uric acid, HDL and triglycerides ($p<0.05$).
Conclusions: In a general population arterial stiffness is increased in patients with sustained hypertension and with ambulatory hypertension in respect to subject with clinic and 24 hours normal BP values. The use of BP monitoring may be useful for the identification of patients with more pronounced vascular target organ damage.

10.01
ARTERIAL STIFFNESS IS ASSOCIATED WITH ELASTIN DEFRAGMENTATION AND MEDIAL COLLAGEN CONTENT IN THE HUMAN AORTA

A. Mahmud [1], M. McNulty [1], E. McGovern [2], V. Young [2], M. Tolan [2], J. Feely [1]. *[1]Department of Pharmacology & Therapeutics, Trinity College*