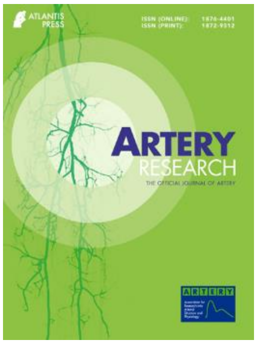

Artery Research

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

8.3: REDUCED SYSTEMIC ARTERIAL COMPLIANCE IN STABLE HEART TRANSPLANT PATIENTS

L.A. Rustad, K. Nytrøen, B.H. Amundsen, P. Segers, S. Aakhus

To cite this article: L.A. Rustad, K. Nytrøen, B.H. Amundsen, P. Segers, S. Aakhus (2010) 8.3: REDUCED SYSTEMIC ARTERIAL COMPLIANCE IN STABLE HEART TRANSPLANT PATIENTS, Artery Research 4:4, 151–151, DOI: https://doi.org/10.1016/j.artres.2010.10.186

To link to this article: https://doi.org/10.1016/j.artres.2010.10.186

Published online: 21 December 2019

50—00 mg daily for one year. Endothelial function (Salbutamol-induced vasodilation), wave reflection (Augmentation index (AI_x)), carotid-femoral pulse wave velocity (PWV), carotid artery intima-media thickness (IMT) and left ventricular wall thickness were measured at baseline, 6 months, and 12 months of treatment.
Results: NEB and MET decreased equally brachial blood pressure (BP), whereas reduction in central pulse pressure and left ventricular wall thickness was significant only in the NEB group. Left ventricular wall thickness change was significantly related to central systolic BP change ($r = 0.41$; $P = 0.001$) and central pulse pressure change ($r = 0.32$; $P = 0.01$). No significant changes in AIx, PWV and IMT were detected in either treatment group. Endothelial function improved significantly after 6 months in the NEB treatment group.
Conclusion: Our study expands earlier observations with vasodilating BB and shows that nebivolol has a stronger impact on central blood pressure and left ventricular wall thickness reduction than metoprolol. Thus, β-blockers with vasodilating properties may offer a clear advantage over a conventional β-blocker in antihypertensive therapy.

8.1
BLOOD PRESSURE INCREASE AND DEVELOPMENT OF TARGET ORGAN DAMAGE IN SUBJECTS WITH HIGH NORMAL BLOOD PRESSURE IN A GENERAL POPULATION SAMPLE. A 9 YEARS FOLLOW-UP

A. Paini *, M. L. Muiesan, M. Salvetti, C. Agabiti Rosei, C. Aggiusti, D. Stassaldi, F. Bertacchini, F. Beschi, M. Castellano, E. Agabiti Rosei
Internal Medicine, University of Brescia, Italy

Background: Subjects with high-normal (HN) blood pressure (BP) may be at increased risk of progression to hypertension (HT) and of cardiovascular events, in comparison with normotensives (NT). Aim of our study was to evaluate the progression to hypertension and the development of target organ damage in a general population in Northern Italy.
Methods: In 585 subjects (age 50 ± 8years, 46%males) a baseline visit and laboratory examinations were performed. Subjects were divided into 3 groups according to systolic (SBP) and diastolic blood pressure (DBP) values: NT (SBP/DBP < 130/85 mmHg); HN(SBP/DBP>130/85 and <140/90 mmHg) and HT (SBP/DBP>140/90 mmHg).In 478 subjects a follow-up(FU) visit, laboratory examinations, measurement of carotid-femoral PWV and carotid IMT were performed after 8.7 ± 2.3years.
Results: at baseline 30% of patients were NT, 25% were HN and 45% were HT. Among patients classified as HN at baseline, 71% developed hypertension at FU, 18% had HN BP, 11% were NT. Among subjects classified as NT at baseline, 34% developed hypertension at FU, 23 % were classified as HN and 43 % were NT. Mean BP values at FU were 129 ± 13/82 ± 7 in NT, 139 ± 13/87 ± 6 in HN, 146 ± 15/89 ± 8 mmHg in HT, respectively (ANOVA $p < 0.001$). At FU in HN and in HT, as compared with NT, a significant increase of PWV (11.2 ± 2.1 and 12.4 ± 3.3 vs 10.1 ± 1.9 m/sec, ANOVA $p < 0.01$) and of common carotid IMT(1.00 ± 0.19 and 1.09 ± 0.27 vs 0.93 ± 0.15 mm, ANOVA $p < 0.01$) was observed.
Conclusions: In a general population in Northern Italy a large proportion of subjects with high normal BP developed hypertension and vascular target organ damage during a 9 years follow up.

8.2
(SHEAR) STRAIN IMAGING OF THE COMMON CAROTID ARTERY

T. Idzenga [1,*], H. H. G. Hansen [1], R. G. P. Lopata [2,3], C. L. De Korte [1]
[1] *Radboud University Nijmegen Medical Centre, Dept. of Peadiatrics, Clinical Physics Laboratory, Nijmegen, Netherlands*
[2] *Maastricht University, Dept. of Biomedical Engineering, Maastricht, Netherlands*
[3] *Eindhoven University of Technology, Dept. of Biomedical Engineering, Eindhoven, Netherlands*

The primary trigger for myocardial infarction and stroke is destabilization of atherosclerotic plaques. The chance of a plaque to rupture is related to its composition and geometry. Ultrasound (shear) strain imaging allows assessment of local tissue mechanics and possible risk assessment of vulnerable plaques.
To non-invasively assess the local tissue mechanics of the common carotid artery radiofrequency data were acquired using a linear array ultrasound transducer (Philips 11-3L, $f_c = 7.5$ MHz) in longitudinal and in transverse direction. In transverse direction we used multiple beam steered angles. Simultaneously the ECG-signal was recorded. Axial and lateral displacement of the local tissue were estimated using a 2D coarse-to-fine cross-correlation based strain algorithm [1]. And from these displacements we derived the radial strain [2] and the longitudinal shear strain [3].
Both strains showed a cyclic pattern with an increase during the systolic and a decrease during the diastolic phase. The first *in vivo* results of radial strain in a plaque show increased strain values in the core of the plaque that might be related to a fatty composition.
The first results of non-invasive ultrasound strain imaging using radio-frequency ultrasound demonstrate the potential of quantifying plaque mechanics. Further validation of these methods will open the door for clinical screening of vulnerable plaques.

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8.3
REDUCED SYSTEMIC ARTERIAL COMPLIANCE IN STABLE HEART TRANSPLANT PATIENTS

L. A. Rustad [1,2,*], K. Nytrøen [1], B. H. Amundsen [2], P. Segers [3], S. Aakhus [1]
[1] *Oslo University hospital, Rikshospitalet, Oslo, Norway*
[2] *NTNU, Dept. of Circulation and Medical Imagine, Trondheim, Norway*
[3] *University of Ghent, Inst. of Biomedical Engineering, Ghent, Belgium*

Purpose: Despite high prevalence of cardiovascular diseases in heart transplanted patients (HTx), the global systemic arterial properties are not well described. Thus, the aim of this study was to evaluate arterial properties in HTx.
Methods: 26 stable heart transplanted patients (age 50 ± 17 years (mean ± SD)) with no signs of rejection or cardiac failure were investigated 4.5 ± 1.8 years after HTx and compared with healthy age-matched subjects with either normal blood pressure or similar brachial mean arterial blood pressure (MAP). Aortic root pressure and flow data were obtained by semi-simultaneous recordings of aortic root Doppler flow velocities, brachial arterial blood pressure and calibrated carotid arterial pulse trace. Systemic arterial properties were described by total arterial compliance(C), arterial elastance (Ea), characteristic impedance (Z_0), and peripheral vascular resistance (TVR). Parameters were estimated by Fourier analysis of central aortic pressure and flow data and methods based on the 2-element windkessel model (pulse pressure method).
Results(Table): HTx patients had significantly higher Ea and lower C compared with the normotensive subjects. However, C trended lower ($p = 0.07$) in the MAP-matching group compared with the normotensive subjects.
Conclusion: Systemic arterial properties in HTx differ significantly from normotensive subjects; however only small variations were seen compared to the MAP-control group. Thus, the low compliance is likely due to a pressure-dependent effect.

	TxCor	MAP-control	Normotensive	P-ANOVA
Subjets (men/women)	26 (19/7)	22 (17/5)	24 (16/8)	
MAP (mmHg)	102 ± 12	103 ± 7 †	89 ± 6 **	< 0.001
Heart rate (beats/s)	79 ± 13	62 ± 9 **	60 ± 9 **	< 0.001
Cardiac output (l/min)	5.0 ± 1.1	5.1 ± 1.3	4.8 ± 1.0	0.57
TVR (mmHg/(ml/s))	1.28 ± 0.4	1.26 ± 0.3	1.17 ± 0.3	0.41
Z0 (103mmHg/(ml/s))	98 ± 29	104 ± 25	111 ± 41	0.36
C (ml/mmHg)	0.88 ± 0.3	0.95 ± 0.2	1.12 ± 0.2 **	0.005
Ea (mmHg/ml)	1.74 ± 0.5	1.43 ± 0.3 *	1.27 ± 0.4 **	0.001

Mean ± SD, * $p < 0.05$ and ** $p < 0.005$ compared with TxCor. †$p < 0.005$ compared with normotensive subjects.

8.4
SYSTEMATIC REVIEW OF THE EFFECT OF ANTI-HYPERTENSIVE DRUG THERAPY ON ARTERIAL STIFFNESS

L. D'Elia *, R. Ippolito, F. Galletti, P. Strazzullo
Department of Clinical & Experimental Medicine, Federico II University of Naples, Naples, Italy

Background: Since arterial stiffness (AS) is one of the factors influencing prognosis in hypertensive patients, we performed a systematic review of studies testing the effect of anti-hypertensive therapy on AS.
Methods: We performed a systematic search of the literature using on-line databases (1966-Dec 2009). We included studies on Pulse Wave Velocity