



Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

Journal Home Page: <https://www.atlantis-press.com/journals/artres>

P11.17: CALCIFICATION OF THE THORACIC AORTA ON CHEST X-RAY – ASSOCIATIONS WITH ABDOMINAL AORTIC CALCIFICATION AND PULSE WAVE VELOCITY IN PATIENTS ON RENAL REPLACEMENT THERAPY

P. Schjelderup, J.H. Christensen, J.D. Jensen, K.E. Otte, S. Ladefoged, P.B. Jensen

To cite this article: P. Schjelderup, J.H. Christensen, J.D. Jensen, K.E. Otte, S. Ladefoged, P.B. Jensen (2011) P11.17: CALCIFICATION OF THE THORACIC AORTA ON CHEST X-RAY – ASSOCIATIONS WITH ABDOMINAL AORTIC CALCIFICATION AND PULSE WAVE VELOCITY IN PATIENTS ON RENAL REPLACEMENT THERAPY, Artery Research 5:4, 196–197, DOI: <https://doi.org/10.1016/j.artres.2011.10.173>

To link to this article: <https://doi.org/10.1016/j.artres.2011.10.173>

Published online: 14 December 2019

Methods: A total of 50 men aged 28 to 50 (mean age: 43 ± 5) years with angiographically proven CAD underwent multislice computed tomography (MSCT) studies. Those with arterial hypertension, diabetes mellitus or marked hypercholesterolemia (LDL cholesterol >4.5 mmol/l) were excluded from the study. Coronary calcification was quantified using the Agatston score (CCS). The results were compared with a group of 30 controls without CAD, matched for sex, age, and risk factors.

Results: Calcifications were present in 86% of patients with CAD and in 16.7% of controls ($p < 0.001$). The mean (SD) CCS was 285 ± 314 in the CAD patients versus 31 ± 129 in the controls ($p < 0.001$). Absence of calcium, CCS of 1 to 99 (mild), 100 to 399 (moderate), and ≥ 400 (severe) was observed in 7 (14%), 16 (32%), 15 (30%), and 12 (24%) of the patients with CAD, and in 25 (84%), 3 (10%), 1 (3%), and 1 (3%) of the patients without CAD, respectively. Extent of coronary calcification in the CAD patients was not related to the severity of CAD.

Conclusion: In young and middle-aged patients with new onset CAD the presence and extent of coronary calcification is significantly greater than in matched controls.

P11.14 INFLUENCE OF SUBCLINICAL THYROID FAILURE ON ARTERIAL STIFFNESS IN WOMEN WITH ARTERIAL HYPERTENSION

O. Ryabtceva, Z. Blankova, T. Chazova, F. Ageev, I. A. Orlova
Russian Cardiology Research Center, Moscow, Russian Federation

Background: The association between arterial stiffness increasing and mortality in patients with arterial hypertension (AH) is well recognized. There is ongoing debate whether subclinical thyroid failure may exert deleterious effects on the cardiovascular system with the consequences of increased morbidity and mortality. The OBJECTIVE of our study was to examine influence subclinical hypothyroidism (SCH) on arterial stiffness in women with arterial hypertension.

Methods: 40 females with AH (20 pts with normal thyroid function (control) and 20 with SCH underwent brachial-ankle pulse wave velocity (PWVba) measurements for evaluation of arterial stiffness. Thyroid-stimulating hormone (TSH) level was 4.01-10.0 mU/ml in SCH patients. Mean FT4 was respectively 14.8 ± 2.0 and 15.2 ± 2.8 pmol/L in control and SCH group ($p = 0.298$).

Results: Hypothyroid patients demonstrated higher PWVba (15.0 ± 2.4 m/s vs 13.3 ± 2.3 m/s, $p = 0.016$). There were no differences in age (65.1 ± 6.9 years vs 64.5 ± 6.7 years, $p = 0.397$) and systolic pressure (135.7 ± 19.0 vs 137.2 ± 18.2 , $p = 0.401$) between SCH patients and controls.

Conclusions: Subclinical hypothyroidism is associated with changes in arterial stiffness. Significant changes of arterial stiffness were observed in subjects with TSH 4.01-10.0 mU/ml suggesting that even early stage of thyroid failure is associated with increased cardiovascular risk.

P11.15 ANGIOTENSIN CONVERTING ENZYME -2 (ACE-2) POLYMORPHISMS RS4646156 AND RS4646174 ARE ASSOCIATED WITH CENTRAL PULSE PRESSURE, BRAIN NATRIURETIC PEPTIDE AND NYHA CLASSIFICATION IN PATIENTS WITH CHRONIC HEART FAILURE

A. Vašků¹, J. Pařenica², M. Pávková-Goldbergová¹, P. Kala², M. Poloczek², J. Špinar²
¹Masaryk University, Faculty of Medicine, Department of Pathophysiology, Brno, Czech Republic
²Masaryk University, Faculty of Medicine, Faculty Hospital Brno, Department of Internal Cardiology Medicine, Brno, Czech Republic

The pulse pressure (PP) is an independent predictor of cardiovascular morbidity and mortality. The PP level increases with the age and this increase is due to stiffness of large arteries. Angiotensin I converting enzyme 2 cleaves angiotensin I to angiotensin - (1-7) with vasodilatation and antiproliferative effects. In human medicine, the ACE-2 relation to the pulse pressure has not been studied yet. The aim of the study was to test possible association among phenotypes (central pulse pressure evaluated by invasive method in stable patients with well-preserved systolic function of the left ventricle, BNP as a marker of a severity of the disease and NYHA classification) and genotypes in two polymorphisms of ACE-2 gene.

Methods: A group of 312 patients with chronic heart failure (170 men and 142 women, median age 63 years) was enrolled in the study. The rs4646156 and rs4646174 polymorphisms in ACE-2 gene were detected by Tasman SNP genotyping.

Results: The central pulse pressure was highly significantly correlated with BNP, NT-proBNP and big endothelin levels. We observed significant

differences in central pulse pressure among carriers of different genotypes of both ACE-2 polymorphisms ($P = 0.01$ and 0.03 , respectively). For the heterozygote genotype AT (rs4646156) and CG (rs4646174) we report the higher risk for women in all NYHA groups compared to men ($P < 0.04$ - 0.000001) with average sensitivity of 0.550 and specificity of 0.980.

Conclusion: The heterozygote genotypes in ACE-2 polymorphisms are more risky for women with chronic heart failure compared to men.

P11.16 BLOOD PRESSURE VARIABILITY IS ASSOCIATED WITH AORTIC STIFFNESS AND TROPONIN-T IN PATIENTS WITH CKD STAGES 3 AND 4

L. A. Tomlinson¹, M. L. Ford², E. R. Smith², S. G. Holt³, C. Rajkumar²
¹Addenbrooke's Hospital, Cambridge, United Kingdom
²Brighton and Sussex Medical School, Brighton, United Kingdom
³Monash University, Melbourne, Australia

Introduction: Clinic blood pressure predicts future cardiovascular risk but variability of systolic blood pressure (SBP) may be closely associated with adverse outcomes. Increased variability of SBP may be due to loss of buffering capacity in the aorta through increased vascular stiffness. This may be important in chronic kidney disease (CKD) where patients have accelerated aortic stiffening and high cardiovascular mortality. However, the relationship between aortic stiffness and BP variability in patients with CKD has not previously been studied.

Methods: 150 patients with CKD stages 3-4 in a prospective study of cardiovascular risk underwent 24-hour ambulatory blood pressure (24h-ABPM) and measurement of aortic pulse wave velocity (aPWV). Serum Troponin-T (TnT) was measured using a high-sensitivity assay.

Subject characteristics (n=150)

Age (years)	69 ± 11
Male gender (%)	73
Systolic (mmHg)	150 ± 20
Diastolic BP (mmHg)	81 ± 11
Diabetic (%)	22
Cardiovascular disease (%)	39
eGFR (mL/min/1.73m ²)	32 ± 11

Results: Standard deviation of 24h-ABPM SBP was associated with age ($\rho = 0.28, p < 0.001$), clinic SBP ($\rho = 0.20, p = 0.01$), heart rate ($\rho = 0.30, p < 0.001$), aPWV ($\rho = 0.22, p < 0.01$) and TnT ($\rho = 0.26, p = 0.001$). SD 24h-ABPM was higher among diabetics (16 vs 18 mmHg, $p < 0.05$) and people with previous cardiovascular disease (15 vs 18 mmHg, $p = 0.001$). There was no significant difference in SD of 24h-ABPM SBP between people treated with different antihypertensive drugs or total number of antihypertensives taken. In stepwise multivariable analysis, factors independently associated with SD 24h-ABPM SBP were heart rate, cardiovascular disease and TnT ($R^2 = 0.18, p < 0.001$).

Conclusion: Aortic stiffness is associated with blood pressure variability. However, may be due to the association of cardiovascular disease with aortic stiffness rather than a causal mechanism.

P11.17 CALCIFICATION OF THE THORACIC AORTA ON CHEST X-RAY – ASSOCIATIONS WITH ABDOMINAL AORTIC CALCIFICATION AND PULSE WAVE VELOCITY IN PATIENTS ON RENAL REPLACEMENT THERAPY

P. Schjelderup¹, J. H. Christensen¹, J. D. Jensen³, K. E. Otte⁴, S. Ladefoged², P. B. Jensen⁵
¹Department of Nephrology, Aalborg Hospital, Aarhus University Hospital, Aalborg, Denmark
²Department of Nephrology, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark
³Department of Nephrology, Aarhus University Hospital, Aarhus, Denmark
⁴Department of Nephrology, Fredericia Hospital, Fredericia, Denmark
⁵Department of Nephrology, Odense University Hospital, Odense, Denmark

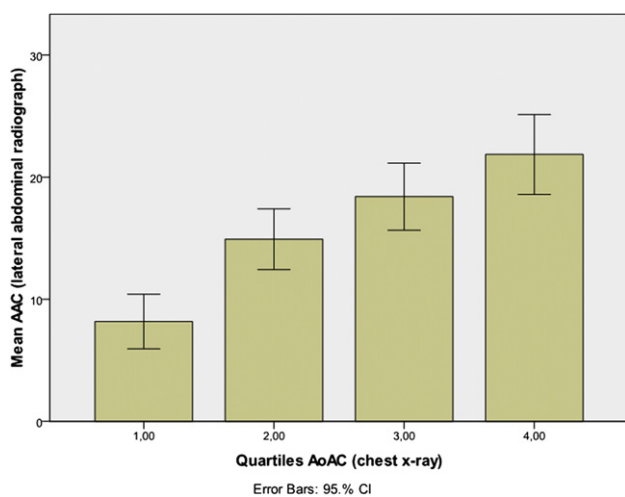
Background: Abdominal aortic calcification (AAC) on lateral abdominal x-ray and carotid-femoral pulse wave velocity (PWV) are independent predictors of mortality and non-fatal CV events in patients on renal replacement therapy (RRT). Guidelines suggest that the presence of AAC can be used to identify patients at high risk. In this study aortic arch calcification (AoAC)

on chest x-ray was correlated with the above mentioned established markers of vascular calcification.

Methods: AAC, AoAC and PWV were measured in 88 patients on RRT who were Danish participants in a European multicenter cross-sectional study. Inclusion criteria were: >18 years of age and >3 months of maintenance haemo- or peritoneal dialysis treatment. AoAC was measured using a semi-quantitative method. The cross section of the aortic arch was divided into 16 sectors on a plain frontal chest x-ray. Sectors showing signs of calcified plaques in the form of typically shaped densities were identified. The carotid-femoral PWV was measured using applanation tonometry.

Results: 72% had a AoAC score > 0 compared to 81 % with a AAC score > 0. AoAC was significantly positively correlated with AAC ($r=0.69$, $p<0.001$) and PWV ($r=0.35$, $p<0.001$). The positive- and negative predictive values of AoAC with respect to AAC were 98% and 32%, respectively.

Conclusion: The presence of calcification on chest x-ray was positively correlated with AAC and PWV. Chest x-ray is inexpensive and frequently obtained in this patient population. We believe it may provide valuable data on calcification and may be used in risk stratification of dialysis patients. Further evaluation is required.



P11.18 DETERMINANTS OF SUBCLINICAL ORGAN DAMAGE IN PAEDIATRIC KIDNEY TRANSPLANT RECIPIENTS

Kis É. ¹, O. Cseprekál ¹, A. Kerti ¹, T. Horváth ², A. J. Szabó ¹, M. Kollai ², G. S. Reusz ¹

¹1st Department of Pediatrics, Semmelweis University, Budapest, Hungary

²Clinical Experimental Research and Institute of Human Physiology, Semmelweis University, Budapest, Hungary

Increased cardiovascular (CV) risk caused by uraemic milieu decreases after kidney transplantation (Tx), however it remains 5 fold higher than in the general population. CV mortality can be characterized by non-invasive measure of arterial stiffness (Ast), (Pulse Wave Velocity (PWV), distensibility (D), and Intima media thickness (IMT)) Clinical studies on arterial wall damage in kidney transplant children are sparse.

Our aim was to evaluate the Ast parameters and the possible pathophysiological factors responsible for impaired arterial function among kidney Tx patients. PWV, D and IMT of 24 Tx children (age: 16.6 ± 4.9 years) were measured by applanation tonometry, and carotid artery ultrasound. Laboratory values of lipid, calcium phosphate metabolism, and renal function were also assessed at the time of measurements and retrospectively one year after Tx.

PWV SDS of Tx showed a tendency of discrete elevation (0.97 ± 0.71), IMT was above the 95th percentile (1.64 ± 1.36). D SDS was in the normal range (-0.01 ± 0.98). Compared to the controls PWV SDS showed positive correlation with creatinine, P, CaxP ($r=0.51$; $r=0.4$; $r=0.46$; $p<0.05$). P, CaxP values were significantly higher in Tx with IMT >95th percentile (0.13 vs. 2.61) one year after tx. (P 1.24 vs. 1.63 mmol/l; CaxP: 3.19 vs 4.18 mmol²/l²).

To conclude, 4.5 years after Tx, both morphological and functional changes can occur. Disturbances of calcium phosphate metabolism can enhance the

progression of athero- and arteriosclerosis, thus the impairment of arterial elastic function in children after transplantation.

Supported by: OTKA 71730, ETT 06-123/2009, TÁMOP-4.2.2-08/1/KMR-2008-0004

P11.19 DIFFERENT BEHAVIOUR OF ARTERIAL STIFFNESS ACCORDING SEX AND AGE IN A POPULATION OF PATIENTS IN PRIMARY PREVENTION

P. Forcada, D. Olano, S. Gonzalez, S. Obregon, C. Castelaró, C. Kotliar
Hospital Universitario Austral, Pilar, Argentina

Background: There is conflicting evidence about the arterial stiffening process with age. Although differences according sex have been described in the CV system (heart, emodynamics, IMT etc) little was described about arterial stiffening according sex and age simultaneously.

Objective: To analyze arterial stiffness parameters as Pulse Wave Velocity (PWV), pulse pressure (PP) and augmentation index (Aix) in central and peripheral arteries according sex and age in large series of p. in primary CV prevention.

Methods: We evaluated 3523 p. without CV history, who underwent a complete vascular non invasive assessment including PWV, PP and Aix (using Complior and Arteriograph devices). The data were compared according age (deciles) and sex.

Results: BP was higher in males than in women from 20 y.o until 50's.

PWV was significantly higher in males than in females at every age.

PP in central aorta and peripheral vessels was higher in males until 50's and then raised in women. PP Ao began to be higher at this age in females than peripheral PP. (see table)

Aix were higher in women, and the negative value of peripheral augmentation shifted to positive in women at 40's. In men the rise of central pressures and the positive turn of the peripheral augmentation index occurred late in 60's.

Conclusion: Several explanations to these phenomena can be considered, but: a) Increased PWV and PP in men b) a higher central aortic PP in women and c) early peripheral arterial stiffening in females should be taken into account when tailoring antihypertensive treatment according sex and age. Comparison of main data according sex

PARAMETERS	TOTAL POP (4523)	MALES (2991)	FEMALES (1523)	P value (M vs F)
AGE	50 +/- 12	49 +/- 12	52 +/- 12	<.001
SBP	134 +/- 18	135 +/- 17	132 +/- 20	<.001
DBP	83 +/- 14	84 +/- 11	82 +/- 19	<.001
PWV	10,7 +/- 2	10,9 +/- 3	10,2 +/- 2	<.001
PP Ao	48 +/- 17	46 +/- 17	53 +/- 17	<.001
PP B	51 +/- 16	60 +/- 12	51 +/- 21	<.001
Aix Ao	28 +/- 14	24 +/- 14	36 +/- 12	<.001
Aix B	-10 +/- 34	-19 +/- 32	10 +/- 31	<.001

P11.20 COMMON CAROTID ARTERY PARAMETERS AND CARDIOVASCULAR RISK FACTORS IN HYPERTENSIVE ADOLESCENTS

K. Simanaukas ¹, V. Sapoka ¹, V. Kasiulevicius ¹, K. Ryliskiene ², A. Jankauskiene ³, T. Rekasius ⁴, A. Laucevicius ⁵

¹Vilnius University, Faculty of Medicine: Clinic of Internal Diseases And Family Medicine, Vilnius, Lithuania

²Vilnius University, Faculty of Medicine: Clinic of Neurology and Neurosurgery, Vilnius, Lithuania

³Vilnius University, Faculty of Medicine: Clinic of Children's Diseases, Vilnius, Lithuania

⁴Vilnius Gediminas Technical University Department of Mathematical Statistics, Vilnius, Lithuania

⁵Heart and Vascular Medicine of Vilnius University Hospital Santariskiu Klinikos, Vilnius, Lithuania

Objective: According data of clinical studies the relationship between cardiovascular risk factors and measured common carotid artery (CCA) intima-media thickness (IMT) is a marker of preclinical atherosclerosis in adolescence. The aim of our prospective cross-sectional study was to