



## Artery Research

ISSN (Online): 1876-4401

ISSN (Print): 1872-9312

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

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### P2.17: FEASIBILITY OF USING COMPLIOR ANALYSE TO MEASURE CENTRAL SYSTOLIC BLOOD PRESSURE DURING DIALYSIS

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**To cite this article:** Mabrouk Brahimi, Martine Catherine, Nathalie Stocard, Rachid Mojaat, Charles Chazot, Sandrine Millasseau\*, Denis Chemla (2015) P2.17: FEASIBILITY OF USING COMPLIOR ANALYSE TO MEASURE CENTRAL SYSTOLIC BLOOD PRESSURE DURING DIALYSIS, Artery Research 12:C, 9–10, DOI:  
<https://doi.org/10.1016/j.artres.2015.10.222>

**To link to this article:** <https://doi.org/10.1016/j.artres.2015.10.222>

Published online: 7 December 2019

for increasing age (20-80y) and decreasing DBP (100-60mmHg). Standardized hazard ratio (HR) mean[95% confidence interval](p-value) for NLM was 1.7 [1.18-2.45](p=0.005) for DBP<=78mmHg (63 deaths) and 0.78[0.47-1.30](p=0.34) DBP>78mmHg (40 deaths). Similar HR values were found without adjustment. CONCLUSION: Arterial nonlinearity predicts mortality in hypertensive patients with low ambulatory DBP.

#### P2.13

#### BLOOD PRESSURE PROFILE CHANGES BETWEEN 7TH AND 11TH YEAR OF LIFE IN CHILDREN BORN PREMATURELY WITH EXTREMELY LOW BIRTH WEIGHT IN COMPARISON TO CHILDREN BORN ON TIME

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There have been research trials analyzing the impact of prematurity on the prevalence of hypertension, however the prospective, long-time observation is uncommon. The aim of this study was to evaluate the prevalence of hypertension at the age of 7 and 11 years of regional cohort of preterms with birth weight  $\leq 1000$ g.

The study included 67 children with birth weight  $\leq 1000$ g born in Malopolska. The control group consisted of 38 children born at term, matched for age. Each child underwent 24-hour ambulatory blood pressure measurement twice – at the age of 7 and 11 years. The presence of hypertension based on two definitions: 1) Mean Arterial Pressure  $\geq 95$  percentile for gender and height; 2) number of individual measurements  $\geq 95$  percentile for gender, age and height  $>25\%$  was estimated.

At the age of 7 years preterm infants had significantly higher incidence of hypertension, defined on the basis of MAP (15%vs.0%; p<0.015), and on the percent of individual measurements (56%vs.33%, p<0.036). After taking into account the group of patients who received anti-HT treatment after first part of study, the incidence of hypertension at the age of 11 based on MAP was 19%vs.10% and based on individual measurements was 36.5%vs.24% (the differences are not statistically significant). In both time points a higher mean heart rate in the group of preterms was found (7 years of age: 93vs.87/min., p<0.001; 11 years of age 87vs.83/min, p=0.039).

Children born prematurely are predisposed to hypertension in later life. Persistence of increased heart rate in former preterms was shown.

#### P2.14

#### PARAMETERS OF ARTERIAL STIFFNESS IN OSTEOARTHRITIS PATIENTS AND IN HEALTHY CONTROLS

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Osteoarthritis (OA) and cardiovascular diseases (CVD) are prevalent conditions and often co-exist. Vascular involvement in pathogenesis of CVD and OA gives reason to investigate arterial stiffness in OA. The aim of this study is to investigate the associations between OA and arterial stiffness.

Arterial stiffness characteristics were measured with Sphygmocor device in 54 patients (age  $62 \pm 7.4$  years (mean  $\pm$  SD)) with end-stage osteoarthritis before knee and hip replacement and compared to 54 age and sex matched controls ( $61 \pm 7.0$  years). Independent Student's t-test was used to compare the means. Correlation between variables was determined using Pearson's correlation analysis and multiple regression analysis.

Aortic pulse wave velocity and augmentation index were increased in patients with OA compared to controls ( $8.8 \pm 1.6$  m/s vs  $7.9 \pm 1.5$  m/s, p=0.004;  $25.2 \pm 9.3\%$  vs  $21.2 \pm 10.4\%$ , p=0.04, respectively). The small artery elasticity index was significantly lower in OA patients than in healthy controls ( $3.2 (2.20-6.05)$  ml/mmHg $\times 100$  (median (interquartile range) vs  $5.08 (3.1-8.39)$  ml/mmHg $\times 100$ , p=0.007, respectively). The level of central systolic and diastolic blood pressure were related to LDL- cholesterol

(r=0.42; p=0.002; r=0.37; p=0.006, respectively) and urea (r=0.51; p<0.001) and urea level was also associated with aortic pulse wave velocity in the patients (r=0.51; p<0.001)

This study shows that patients with OA have increased arterial stiffness compared to healthy controls. Potential link between arterial stiffening and OA could suggest that alterations are involved in OA pathogenesis and be responsible for increased cardiovascular risk in OA patients.

#### P2.15

#### IRRITABLE AFFECTIVE TEMPERAMENT IS A PREDICTOR OF PULSE WAVE VELOCITY, WHEREAS HYPERTHYMIC AFFECTIVE TEMPERAMENT DETERMINES AUGMENTATION INDEX IN CHRONIC HYPERTENSION

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**Background:** Affective temperaments (anxious, depressive, cyclothymic, irritable and hyperthymic) are subclinical manifestations of major mood disorders and there is cumulating evidence about their involvement in somatic disorders as well. The aim of our study was to evaluate the associations of affective temperament scores with arterial stiffness parameters in hypertensive patients.

**Methods:** In this cross-sectional study, chronic, well-controlled hypertensive patients, with no history of depression, completed the TEMPS-A, Beck Depression Inventory (BDI) and Hamilton Anxiety Scale (HAM-A) autoquestionnaires in three GP practices. Arterial stiffness was measured with the tonometric PulsePen device.

**Results:** Altogether 183 patients were involved. In regression analysis irritable temperament score was a predictor of pulse wave velocity (adjusted for age, brachial systolic blood pressure, onset of hypertension, serum glucose, GFR-EPI, BDI and HAM-A,  $\beta=0.170$ , p=0.031), whereas hyperthymic temperament score was a predictor of augmentation index (adjusted for age, gender, smoking, heart rate, BDI and HAM-A,  $\beta=-0.211$ , p=0.004).

**Limitations:** The cross-sectional design of the study precludes the evaluation of causality.

**Conclusion:** Our results suggest that high irritable temperament score might be a marker of increased, whereas high hyperthymic score a decreased cardiovascular risk among chronic hypertensive patients, however, follow-up studies are required to confirm this hypothesis. The evaluation of affective temperaments seems to be a potential tool to study psychosomatic processes.

#### P2.17

#### FEASIBILITY OF USING COMPLIOR ANALYSE TO MEASURE CENTRAL SYSTOLIC BLOOD PRESSURE DURING DIALYSIS

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Central systolic blood pressure (cSBP) could be helpful to monitor hypotension during dialysis. However most cSBP devices are based on peripheral estimates which might be unreliable during the specific hemodynamic state of dialysis. Complior Analyse (Alam Medical, France) presents the advantage of measuring cSBP, hand-free, directly from the carotid artery with no mathematical estimation. Our study aims document cSBP variability from Complior Analyse before and during dialysis.

cSBP was measured in 19 stable patients (10M/9F, age:65 $\pm$ 16yrs) with regular heart rate who underwent dialysis in Fresenius center, Montfermeil hospital, France (10 patients before dialysis, 13 patients 130 $\pm$ 24min after the start of dialysis including 4 patients with data both before and during dialysis). Carotid waveforms were measured in triplicate within 5min and

calibrated to mean (MAP) and diastolic pressures (DBP) obtained with a Philips SureSigns monitor on the fistula-free arm. Mean $\pm$ SD values and coefficient of variation(CV) of repeated measurements are shown below:

**Pre-dialysis CV During dialysis CV**

Peripheral SBP(mmHg)	139 $\pm$ 16	4%	120 $\pm$ 16	7%
Peripheral DBP(mmHg)	74 $\pm$ 12	5%	70 $\pm$ 8	6%
Peripheral MAP(mmHg)	99 $\pm$ 13	6%	88 $\pm$ 12	7%
Central cSBP(mmHg)	127 $\pm$ 20	3%	117 $\pm$ 6	5%

Peripheral form factor (FF) was 37 $\pm$ 13% (range 19-59) before dialysis and 39 $\pm$ 21% (13-61) during dialysis while central FF was 45 $\pm$ 7% (30-57) and 39 $\pm$ 21% (21-46), respectively.

Estimation of cSBP during dialysis was feasible with Complior Analyse. Its variability was similar to peripheral BP variability. The wide range of peripheral form factor values suggested that there is a need to improve peripheral BP estimation during dialysis.

**P2.18**

**IMPACT OF CARDIOVASCULAR RISK FACTORS ON CAROTID STIFFNESS AND CAROTID INTIMA MEDIA THICKNESS – GENDER DIFFERENCES**

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**Background and purpose:** Whether the influence of risk factors on carotid stiffness (CS) and carotid intima media thickness (CIMT) is modulated by gender is still unclear. The aim of our study was to examine the association between cardiovascular (CV) risk factors, CS and CIMT in men and women.

**Material and methods:** 252 subjects (including 132 women), mean age: 55 years, with CV risk factors and without the history of manifest CV disease underwent the examination of CS parameters and CIMT. The following CS parameters: beta stiffness index (beta), Peterson's elastic modulus (Ep), one-point pulse wave velocity (PWV-beta) and arterial compliance (AC) were measured with the use of the high-resolution echotracking system.

**Results:** The multivariate analysis revealed that age, diabetes and MAP were independent determinants of CS parameters in both men and women. Pulse pressure (PP) was significantly associated with beta ( $\beta$  coefficient +0,261,  $p=0,006$ ), Ep ( $\beta$  coefficient +0,426,  $p<0,001$ ) and PWV-beta ( $\beta$  coefficient +0,283,  $p=0,007$ ) only in women. Of the risk factors significantly associated with CIMT in the multivariate analysis, age was an independent determinant of CIMT in both sexes, while PP ( $\beta$  coefficient +0,317,  $p=0,014$ ) and increased waist circumference ( $\beta$  coefficient +0,207,  $p=0,048$ ) only in women.

**Conclusions:** The influence of CV risk factors on CS and CIMT is modulated by gender. The impact of the pulsatile component of blood pressure on CS and CIMT and of the increased waist circumference on CIMT seems to be more prominent in women than in men.

**P2.19**

**COMPARISON OF BRACHIAL AND CENTRAL BLOOD PRESSURES FROM 2 SPHYGMOCOR XCEL SYSTEMS EQUIPPED WITH A 2M AND 6M-LONG HOSE**

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**Background and aim:** Magnetic resonance imaging (MRI) provides excellent anatomical coverage for local and regional indices of aortic function and structure. However, blood pressure (BP) assessments is usually necessary for the calculation of these functional MRI parameters. Unfortunately, most pressure devices are not safe in high magnetic field. The aim of our study was to evaluate the use of the new SphygmoCor XCEL device (AtCor Medical, Australia) with a 6m hose to estimate central BP.

**Methods and results:** A SphygmoCor XCEL device with a 2m hose and a 2nd device with a 6m hose were fitted simultaneously on both arms of 38 subjects (63% men, median age: 36.8 years (28.5-58.4)). After 5 minutes rest supine, BP was recorded and then cables were changed (cuffs unchanged). Brachial, central BP, augmentation pressure (AP) and augmentation index (Aix) were recorded.

Brachial SBP, DBP, PP, central SBP, DBP PP, AP and Aix from the 2m and 6m device were strongly correlated ( $R^2=0.96$ , 0.91, 0.78, 0.97, 0.85, 0.95, 0.96

respectively,  $p<0.001$  for all.). Bland Altman plots showed no statistical difference between 2 and 6m for brachial and central SBP, DBP, PP values. However there was a difference between AP and Aix recorded with 2m and 6m hose (-2.65 $\pm$ 1.5mmHg,  $p=0.043$  and -5.25 $\pm$ 2.93%,  $p=0.038$  respectively).

**Conclusion:** SphygmoCor Xcel device with a 6m hose, brachial and central BP shows no statistical difference with the standard 2m hose, allowing data to be collected during MRI exams. However other parameters using waveform morphology such as AP and Aix are not so reliable.

**P2.20**

**PERIPHERAL ARTERY DISEASE DETECTED BY ANKLE-BRACHIAL INDEX IS ASSOCIATED TO CARDIAC AND CAROTID ABNORMALITIES IN PATIENTS WITH ARTERIAL HYPERTENSION AND DIABETES**

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Few studies evaluated cardiac or carotid abnormalities in patients with arterial hypertension and diabetes according to the presence of peripheral artery disease detected by abnormal ankle brachial index (ABI). For this purpose, we studied 99 diabetic hypertensive patients with abnormal ( $n=50$ ,  $ABI \leq 0.9$  or  $ABI > 1.4$ ) and normal ( $n=49$ ,  $ABI > 0.9$  or  $\leq 1.4$ ) ABI values. All patients underwent successively to echocardiography and carotid ultrasound. From echocardiographic study, we analyzed the occurrence of a composite endpoint that included significant cardiac morphological and functional changes. The mean age was 65.4 $\pm$ 7 years and 61.6% were women. It was observed a higher prevalence of left atrial enlargement (46%vs.26.5%,  $p<0.05$ ), left ventricular hypertrophy (LVH) (56%vs.26.5%,  $p<0.01$ ), left ventricular systolic dysfunction (12% vs.2%,  $p<0.05$ ) and left ventricular regional kinematics abnormalities (16vs. 0%,  $p <0.01$ ) in patients with abnormal ABI. The left ventricle mass (178.6 $\pm$ 58vs.149.8 $\pm$ 46 g/m<sup>2</sup>,  $p<0.01$ ) was greater in abnormal ABI group. The echocardiographic composite endpoint was more prevalent in abnormal ABI group (84.0%vs.59.2%,  $p <0.01$ ). Binary logistic regression analysis showed abnormal ABI as an independent predictor for the occurrence of echocardiographic composite endpoint (OR=3.43; 95%CI=1.07-11.0;p<0.05) and the presence of LVH (OR=4.35, 95%CI=0.42-13.52,  $p=0.01$ ). Carotid ultrasound revealed a higher frequency of plaque occurrence in common carotid arteries in patients with abnormal ABI (69.6%vs.30.4%,  $p < 0.05$ ). Also, it was noted a higher number of patients from abnormal ABI group with carotid stenosis $>50\%$  (26.5% vs.6.3%;  $p<0.01$ ). In conclusion, in patients with arterial hypertension and diabetes, the presence of peripheral artery disease detected by abnormal ABI was associated to important structural and functional cardiac and carotid modifications.

**P3.1**

**SUB-MAXIMAL EXERCISE BLOOD PRESSURE RELATES TO LEFT VENTRICULAR MASS INDEX, BUT IS DEPENDENT ON LOW AEROBIC CAPACITY**

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**Background:** Exaggerated blood pressure (BP) responses to sub-maximal exercise independently predict cardiovascular (CV) events, mortality and incident hypertension. The aim of this study was to explore relationships between exercise BP, left-ventricular (LV) structure and function and aerobic fitness as potential mechanisms underlying the CV risk associated with sub-maximal exercise BP.

**Methods:** 149 participants aged 40 $\pm$ 2 years, 45% male completed a staged cycle test to estimate physical work capacity (aerobic fitness; PWC170) with concomitant BP measured each two minutes. 2D echocardiography was used to quantify LV mass (obtained from 2D-guided M-mode echo), and LV function (longitudinal strain, haemodynamics).

**Results:** Early-stage exercise systolic BP was associated with aerobic fitness and LV mass index ( $r=0.22$ , and 0.24,  $p<0.05$ ) and was greater in those performing high stage-relative work (high-fitness) compared with low stage-