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### **P5.7: MOBILITY OF CAROTID ARTERY WALL DEPENDS ON LEVEL OF ATHEROSCLEROTIC LESION IN BIFURCATION**

A. Kaloshinaa, O. Kerbikovb, E. Borskayac, T. Krutovab, A. Averyanovb

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## P5.6

## ARTERIAL REMODELING AND ITS RELATIONSHIP WITH BLOOD PRESSURE CONTROL IN CHILDREN WITH NON-DIALYSIS CHRONIC KIDNEY DISEASE

M. Sinha<sup>a,b</sup>, L. Keehn<sup>b</sup>, L. Milne<sup>b</sup>, P. Chowiecnyk<sup>b</sup><sup>a</sup>Evelina London Children's Hospital, Guy's and St. Thomas NHS Trust, London, UK<sup>b</sup>St Thomas' Hospital, Kings College London, London, UK

**Objectives:** To investigate large artery viscoelastic properties in children with non-dialysis stages of CKD and compare these with healthy children with normal renal function and (ii) to evaluate the impact of blood pressure components following adjustment for level of renal dysfunction.

**Methods:** Prospective single centre study including 226 children [188 children with non-dialysis CKD (11.9±3.7 years) and 38 controls (11.5±3.3 years)] were recruited from tertiary out-patient clinics. Common carotid artery parameters were non-invasively determined using a high-definition echotracking system. Peripheral and central BP were also measured non-invasively.

**Results:** When compared to controls, in children with CKD with similar levels of peripheral and central BP, anatomical measures of arterial properties such as lumen diameter and carotid wall thickness remained comparable. In those with BP >75th percentile there were significant differences between elastic properties of the carotid artery when compared with controls: distensibility (92±31 versus 114±33 kPa<sup>-1</sup> x 10<sup>3</sup>, p=0.03), compliance (2.1±0.7 versus 2.6±0.7 m<sup>2</sup> kPa<sup>-1</sup> x 10<sup>6</sup>, p=0.02), Young's elastic modulus (0.151±0.068 versus 0.109±0.049 kPa x 10<sup>-3</sup>, p=0.02) and wall stress (83.6±23.5 versus 68.7±14.9 kPa, p=0.02). These differences were independent of glomerular filtration rate (GFR). Multivariate regression analyses displayed brachial mean arterial pressure (MAP), carotid systolic and carotid pulse pressure were all associated with carotid artery functional elasticity following adjustment for age, body mass index and GFR.

**Conclusions:** Changes in elasticity of the carotid artery is one of the earliest identifiable alterations in children with non-dialysis CKD but is primarily explained by level of blood pressure and not that of renal function.

## P5.7

## MOBILITY OF CAROTID ARTERY WALL DEPENDS ON LEVEL OF ATHEROSCLEROTIC LESION IN BIFURCATION

A. Kaloshina<sup>a</sup>, O. Kerbikov<sup>b</sup>, E. Borskayac<sup>c</sup>, T. Krutovab<sup>c</sup>, A. Averyanov<sup>b</sup><sup>a</sup>I.M.Sechenov First Moscow State Medical University, Moscow, Russia<sup>b</sup>Federal Research Clinical Center FMBA of Russia, Moscow, Russia<sup>c</sup>Federal State Clinical Hospital#86, Moscow, Russia

Ultrasound Speckle Tracking is a novel technique for assessing regional mechanics of carotid artery wall. We hypothesized that atherosclerosis development affects regional mechanics of carotid arteries.

**Methods:** Study population consisted of 27 patients with carotid atherosclerosis (with plaques in carotid bifurcation, degree of stenosis 25-70%, median-40%, measured according to ESC criteria) and 20 patients without plaques in carotid arteries. Patients from both groups had similar demographics and risk factors. Maximum circumferential and longitudinal strain (Sc, Sl) and strain rate (SRc, SRl) were measured for plaque-free area in common carotid artery (CCA) in each patient.

**Results:** CCA of patients without plaques underwent significantly higher deformations than CCA of patients with carotid atherosclerosis (Sl=10.8±4.2 vs 7.3±4.1 and Sc=8.0±1.9 vs 4.4±1.5 for both groups respectively, p<0.05). Longitudinal deformation was significantly higher in patients with mild atherosclerosis (stenosis 25-50%) compared with patients with moderate atherosclerosis (50-70%), Sl=8.3±4.2 vs 4.6±2.6 for patients with mild and moderate stenosis respectively, p<0.05, whereas no significant difference was observed in circumferential deformation. Moderate negative correlation was observed between longitudinal strain and degree of stenosis (r=-0.40, p=0.41) and no significant correlations were found between Sc, SRc and plaque parameters (degree of stenosis, plaque height and length).

**Conclusions:** Atherosclerosis development and plaque buildup in carotid bifurcation affects regional mechanics of plaque free area of CCA. Longitudinal strain might be a more sensible marker for the more advanced phase of the atherosclerotic process. Use of carotid artery strain may help in risk stratification.

## P5.8

## MISMATCH BETWEEN OFFICE BLOOD PRESSURE RESPONSE AND HEMODYNAMIC PARAMETERS IN ROUTINE TREATMENT OF HYPERTENSIVE PATIENTS

P. Forcada<sup>a</sup>, C. Castellaro<sup>a</sup>, S. Gonzalez<sup>a</sup>, S. Obregon<sup>a,b</sup>, J. Chiabaut<sup>a</sup>, C. Kotliar<sup>a,b</sup><sup>a</sup>Hospital Universitario Austral, Buenos Aires, Argentina<sup>b</sup>Santa Maria De La Salud, Buenos Aires, Argentina

**Rationale:** Control of hypertension has been recently improved by means of the rational use of non invasive haemodynamics (NIH). It is specially useful in resistant hypertension and particularly leads to a better BP control, less use of drugs and improved quality of life. Most of these knowledge was obtained from PROBE trials, but as NIH is not available routinely in clinical practice it is very important to understand what happens in real life controlling BP according to current guidelines.

**Methods:** We started to use NIH since January 2011 and we analyzed 1301 patients evaluated up to December 2012 using Z Logic<sup>®</sup>, an analog of Minesota impedance cardiograph. Seventy five patients underwent repeated evaluations in similar conditions, and we compared data from both situations, in fasted resting patients at through of CV medication.

**Results:** See attached table. A non significant reduction of BP was observed, 19 pts. (25%) improved BP control, 6 (8%) worsened and 50 (67%) showed no change. Small and non significant changes were observed in the number and type of drugs. In the improved patients there was a significant reduction of BP and HR without significant changes in haemodynamics.

**Conclusion:** These results can be explained by an initial lack of experience in the use of the NIH to treat hypertensive patients. When NIH is not taken into account, a large proportion of patients remain uncontrolled and the underlying haemodynamic pattern could explain the lack of effective BP control. Even in those controlled, still persist haemodynamic disturbances.

## P5.9

## LACK OF RECOVERY IN NOCTURNAL DECLINE OF HEART RATE AND BLOOD PRESSURE AFTER HEART TRANSPLANTATION

P. Meani<sup>a,b</sup>, M. Varrenti<sup>a,b</sup>, L. Giupponi<sup>a,b</sup>, L. Bonacchini<sup>a,b</sup>, V. Riva<sup>a,b</sup>, A. Maloberti<sup>b</sup>, F. Turazza<sup>a</sup>, M. Frigerio<sup>a</sup>, G. Parati<sup>b</sup>, S. Wassertheurer<sup>c</sup>, C. Giannattasio<sup>a,b</sup><sup>a</sup>Hospital Cà Granda Niguarda, Milan, Italy<sup>b</sup>Milano Bicocca University, Milan, Italy<sup>c</sup>AIT Austrian Institute of Technology GmbH, Wein, Austria

**Background:** The cardiac transplant (CTr) patient provides a unique model for the study of blood pressure (BP) and heart rate (HR) changing. The parasympathetic and sympathetic influences ordinarily regulate circadian rhythm. This lack is known as denervation and these nerves rarely grow back. The aim of our study is to investigate the circadian rhythm of BP and HR in relationship with PWV and Alx over 24 hours.

**Method:** We collected anthropometric parameters, clinical history, blood test and echocardiogram in 24 HT patients (12 HT after CTr and HT controls). ABPM, PWV and Alx were recorded over 24 hours with Mobilograph device. The HT+CTr was compared with age/gender matched HT controls. Non-parametric statistic analysis was performed.

**Results:** The characteristics of CTr and controls had similar age (55±14 vs 59±12 yrs), gender (9M and 3F), BMI (25.8±5.2 vs 27.9±4.2 kg/m<sup>2</sup>) and serum creatinine levels (1.6±0.4 vs 0.9±0.2). The mean years after transplant were 10.4. 24h BP, MAP and HR were similar in two groups (BP: 128±11.23/78.16±8.23 vs 124.92±14.95/79.16±12.6 MAP: 100.92±7.8 vs 100±13 mmHg, HR: 74.5±11 vs 69±10). The same was for daily BP, PWV (8.15±1.8 vs 8.2±1.3 m/s) and Aix (23.6±7.5 vs 22.8±5.8%) which, however, had not circadian pattern. On the contrary, MAP and HR were higher in CTr during nighttime (101±10.44 vs 90±10 mmHg, p=0.039; 70.66±11.1 vs 62±9 bpm, p=0.05). Consequentially, no-dipper and inverse phenomenon were higher in CTr (chi-square, p<0.05).

**Conclusions:** Our findings show that PWV and Alx haven't circadian variation. CTr haven't circadian rhythm of BP and HR also 10 years after transplant. Thus, cardiac innervation has a crucial role in dipping phenomenon. This does not recover over time.