

## PUB298

**Serum Nitric Oxide and Natriuretic Peptides Have a Relationship with Whole Blood Viscosity in End-Stage Renal Disease Undergoing Hemodialysis** Jong-Hwan Jung,<sup>1</sup> Kyung Pyo Kang,<sup>2</sup> Sung Kwang Park,<sup>2</sup> Young I. Cho,<sup>3</sup> Won Kim.<sup>2</sup> <sup>1</sup>Dept of Internal Medicine, Wonkwang Univ Hospital, Iksan, Jeonlabukdo, Korea; <sup>2</sup>Dept of Internal Medicine, Chonbuk National Univ Medical School, Jeonju, Jeonlabukdo, Korea; <sup>3</sup>Mechanical Engineering and Mechanics, Drexel Univ, PA.

**Background:** A change of whole blood viscosity (WBV) may increase risk of major atherosclerotic events. NO regulates the renal function through the modulation of the vascular tone. WBV related with vascular shear stress may be linked to production of NO. WBV is also associated with volume status during hemodialysis. Atrial natriuretic peptide (ANP) and B type natriuretic peptide (BNP) may be linked to WBV because they can be indicators of blood volume. This study was planned to investigate correlation between WBV at several shear rates during hemodialysis and serum levels of NO, ANP, and BNP in ESRD patients.

**Methods:** This study included 31 end-stage renal disease patients who were enrolled. We measured WBV using a scanning capillary tube viscometer pre- and post- dialysis to quantify viscosity. Serum NO, ANP, and BNP level before hemodialysis was assayed using an ELISA method.

**Results:** The mean WBV variations at shear rates of 1, 5 and 300 s<sup>-1</sup> for pre-dialysis were 168.5±62.5, 76.9±20.6, and 33.3±3.8 mP, respectively. The mean values of post-dialysis WBV obtained at a shear rate of 1, 5 and 300 s<sup>-1</sup> were 240.4±84.4, 100.8±28.0, and 38.5±6.4 mP, respectively. Mean serum levels of NO, ANP, and BNP were 13.97±10.34 µg, 198.85±61.56 pg/mL, and 1233.32±280.81 pg/mL. Serum NO levels was positively correlated with WBV at a shear rate of 1, 5 and 300 s<sup>-1</sup> at pre-dialysis. (p=0.09, p=0.015, and p=0.010, respectively). There was also statistical significance at post-dialysis. Serum ANP levels were negatively correlated with WBV at a shear rate of 1, 5 and 300 s<sup>-1</sup> at only pre-dialysis (p=0.014, p=0.008, and p=0.009, respectively). However, BNP levels did not show any correlation with WBV.

**Conclusions:** Correlation between serum NO, ANP levels and WBV may indicate an important role of endothelial dysfunction in ESRD patients. However, whether monitoring of ANP, BNP, and NO has a relationship with WBV requires further controlled study.

## PUB299

**Reactive Hyperemia Index and Its Clinical Correlates in Dialysis Patients** Wenjin Liu, Meijuan Meng, Junwei Yang. *Center for Kidney Disease, Second Affiliated Hospital, Nanjing Medical Univ, Nanjing, Jiangsu, China.*

**Background:** Reactive hyperemia index (RHI), as a reflection of endothelial function, has been suggested to be an independent predictor of adverse outcome both in the general population and patients with chronic kidney disease. However, its value in risk stratification in patients on maintenance hemodialysis remains inexplicit.

**Methods:** This is a cross-sectional analysis of midterm baseline data from a cohort study. Two-hundred and fifty six dialysis patients from four tertiary hospitals in East China were recruited. Reactive hyperemia index was measured by peripheral arterial tonometry (EndoPAT 2000) on a midweek nondialysis day. Blood pressure level was determined by ambulatory blood pressure monitoring. Demographic and clinical information, as well as routine laboratory results were also recorded. Stepwise linear regression analysis was used to determine independent clinical correlators with natural logarithm of RHI (LnRHI).

**Results:** Among the 258 patients, peripheral arterial tonometry results were available for 218 patients. Average value of LnRHI was 0.57±0.31. In univariate correlation analysis, systolic blood pressure, diastolic blood pressure and heart rate were positively correlated with LnRHI, while age and body mass index (BMI) were inversely related to LnRHI. Stepwise linear regression analysis results demonstrated that systolic blood pressure (β=0.004, p<0.001) and age (β=-0.004, p=0.015) were independently correlates of LnRHI.

**Conclusions:** Our results indicate that reactive hyperemia index was affected by blood pressure and age in patients on maintenance hemodialysis. The prognostic value of RHI remains to be explored by follow up of this study population.

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## PUB300

**Do Patients in Chronic Hemodialysis Have Another Atherogenic Phenotype** Magdalena Dusejovska,<sup>1,2</sup> Barbora Stanková,<sup>2</sup> Marek Vecka,<sup>2</sup> Jana Rychlíková,<sup>2</sup> Lucie Vávrová,<sup>2</sup> Magdaléna Mokřejsová,<sup>3</sup> Ales Zak,<sup>2</sup> Ivan Rychlík.<sup>1,3</sup> <sup>1</sup>Dialysis Unit, Fresenius Medical Care, Prague, Czech Republic; <sup>2</sup>4th Dept of Internal Medicine, 1st Faculty of Medicine Charles Univ and General Teaching Hospital, Prague, Czech Republic; <sup>3</sup>3rd Faculty of Medicine Charles Univ, Prague, Czech Republic.

**Background:** High cardiovascular morbidity and mortality is observed in patients (PTS) with end-stage renal disease (ESRD). Dialysis patients revealed nearly 20 times higher the risk of dying from cardiovascular disease in comparison with the general population. There is growing evidence that dysregulation of lipid metabolism is connected with CKD. The research is now focused on the lipoprotein classes and subclasses and on the possible role of small dense LDL and small HDL particles in the atherogenesis. The aim of our study was to examine differences in individual lipoprotein classes and subclasses between chronic high volume hemodiafiltration (HD HDF) PTS and healthy volunteers (CON).

**Methods:** 60 PTS on HD HDF for at least 12 months and 60 CON were included into the study. PTS and CON were age-matched. Individual lipoprotein classes and subclasses (resp.) were analysed by Quantimetrix Lipoprint (TM) System using Lipoprint LDL and HDL subfractions Kit and Lipoware software.

**Results:** PTS differed from CON by decreased levels of total-, LDL-, and HDL-cholesterol (all P<0.001) that was connected with increased triacylglycerol concentration (P<0.001). Decreased HDL-C level in PTS were connected with fall of intermediate and small HDL levels (both P<0.001). PTS had increased VLDL levels (P<0.01) that was associated with opposite changes in concentration of large (P<0.001) as well as small dense LDL (P<0.05).

**Conclusions:** The results of the study showed different atherogenic phenotype of HD HDF PTS and implicated delayed VLDL/LDL catabolism and remodelling connected with changes in HDL homeostasis that warrant further research. *The study was supported by research from the Ministry of Health of the Czech Republic (project RVO-VFN64165/2012), and the Ministry of Education, Youth and Sports of the Czech Republic (research project PRVOUK-P25/LF1/2 of Charles University in Prague, the 1st Faculty of Medicine).*

## PUB301

**Comparison of 3D Echocardiographic and Cardiac MRI Measurements of Left Ventricular Structure and Function in Hemodialysis Patients** Daniel Scott March,<sup>1,2</sup> Matthew P.M. Graham-Brown,<sup>2</sup> Anna-Marie Marsh,<sup>3</sup> John McEadain,<sup>3</sup> Gerry Patrick Mccann,<sup>3</sup> James Burton.<sup>1,2,3</sup> <sup>1</sup>Dept of Infection Immunity and Inflammation, Univ of Leicester, Leicester, Leicestershire, United Kingdom; <sup>2</sup>John Walls Renal Unit, Univ Hospitals Leicester, Leicester, Leicestershire, United Kingdom; <sup>3</sup>Dept of Cardiovascular Sciences, and NIHR Leicester Cardiovascular Biomedical Research Unit, Univ of Leicester, Leicester, Leicestershire, United Kingdom.

**Background:** This study compared left ventricular (LV) end diastolic volume (LVEDV), LV end systolic volume (LVESV), LV diastolic mass (LVDM) and ejection fraction (EF) in hemodialysis (HD) patients using transthoracic 3D echocardiography (3DE) and cardiac MRI (CMR).

**Methods:** 3DE and CMR (3 Tesla) scans were performed on 25 prevalent HD patients. CMR LV volumetric and mass analysis was undertaken using the software package CMR<sup>12</sup>. 3DE apical four chamber full volume 3DE images (iE33, Philips) were obtained and analysed with vendor specific software. Dependent sample t-tests were performed to compare LV volumes, mass and EF by 3DE and CMR. Pearson's correlation coefficient was performed to assess correlations between variables (LVEDV, LVESV, LVDM and EF) from 3DE and CMR. Statistical significance was accepted at P < 0.05 level.

**Results:** Eight patients were excluded from the analysis due to poor image quality from the 3DE. LVEDV (189.58 mL ± 60.88 mL versus 91.42 mL ± 25.86 mL, P<0.001) and LVESV (94.37 mL ± 39.60 mL versus 39.50 mL ± 12.93 mL, P<0.001) were significantly higher for CMR compared to 3DE. There was no significant correlation between LVEDV (r=0.479, P=0.052) for CMR and 3DE. There was a significant correlation between LVESV (r=0.743, P=0.001) for CMR and 3DE. LVDM (108.05 g ± 35.31 g versus 163.48 g ± 35.32 g, P<0.001) and EF (51.30% ± 6.72% versus 56.45% ± 8.63%, P=0.011) were significantly lower for CMR compared to 3DE. Both LVDM (r=0.735, P=0.001), and EF (r=0.559, P=0.020) significantly correlated between CMR and 3DE.

**Conclusions:** This study suggests 3DE underestimates LVEDV and LVESV compared to CMR. While LVDM is overestimated by 3DE compared to CMR. EF was comparable when measured by both imaging tools.

## PUB302

**Coronary Artery Calcification Score (CACS) and Cardiovascular Events in Maintenance Hemodialysis Patients** Yoshiko Nishizawa,<sup>1</sup> Sonoo Mizuiri,<sup>1</sup> Kyoka Ono,<sup>1</sup> Mariko Asai,<sup>1</sup> Kenichiro Shigemoto,<sup>1</sup> Takao Masaki.<sup>5</sup> <sup>1</sup>Div of Nephrology, Ichiyokai Harada Hospital, Hiroshima, Saeki-ku, Japan; <sup>4</sup>Nephrology, Hiroshima Univ Hospital, Hiroshima, Minami-ku, Japan.

**Background:** Coronary artery calcification is known as a frequent complication in patients with chronic renal failure and contributes to their excess death with cardiovascular events. We examined the relationship between the coronary artery calcification score (CACS) and cardiovascular events in maintenance hemodialysis patients.

**Methods:** A retrospective study was conducted on 322 patients who received maintenance hemodialysis within 5 years between 2011 and 2015. The Agatston's CACS=400, age, sex, dialysis vintage, presence of diabetes mellitus (DM), history of smoking, hemoglobin, serum creatinine(Cr), uric acid, phosphate, intact parathyroid hormone(iPTH), total cholesterol (T-CHO), CRP, β<sub>2</sub>-microglobulin (β<sub>2</sub>MG), albumin-adjusted serum calcium (Ca), geriatric nutritional risk index (GNRI) and PCR were used as independent variable. Risk factors related to cardiovascular events were assessed by univariate and multivariate logistic regression analysis using the above variables. Risk factors related to CACS >400H and serum β<sub>2</sub>MG >30mg/l were also evaluated.

**Results:** CACS(2378±2228 vs 1307±1938H, P<0.01), DM (77 vs 69%, P<0.01), β<sub>2</sub>MG(28±9 vs 25±8mg/l, P<0.05) were significantly higher in patients who had cardiovascular events than patients who did not. While iPTH and CRP were significantly lower (P<0.01). DM (OR 0.34, 95% CI 0.15-0.72, P<0.01), CACS >400 (OR 0.32, 95% CI 0.12-0.72, P<0.05), and β<sub>2</sub>MG (OR 0.96, 95% CI 0.92-1.00, P<0.05) were detected as cardiovascular events-associated factors. Age (OR 0.95, 95% CI 0.92-0.97, P<0.01), DM (OR 0.30, 95% CI 0.18-0.50, P<0.01) were detected as CACS >400-associated