

group. When using CV of BP>6.34% as a cutoff point, crPWV and Aix@75 in patients with CV≤6.34% were significantly improved compared with those with CV>6.34% (P<0.05).

**Conclusions:** The visit-to-visit variability of SBP is correlated with arterial stiffness.

#### GW25-e0783

##### Association between Plasma PAI-1 Levels and Clock Genes Polymorphisms in Primary Hypertensions

Wang Huan, Li Jiuying, Chen Hui

Hypertension Laboratory, Fujian Provincial Cardiovascular Disease Institute, Provincial Clinical College of Fujian Medical University

**Objectives:** To explore the relationship between plasma PAI-1 levels and Clock T3111C & Bmal1 A1420G genes polymorphisms in patients with primary hypertension.

**Methods:** 334 hypertensive patients who never take antihypertensive medications or stop the medications for at least a week were selected from October 2011 to January 2014 in the Department of Cardiovascular Diseases of Fujian Provincial Hospital. The subjects were divided into two groups based on the median of plasma PAI-1 levels (55.83ng/ml): high PAI-1 group (n=167) and control group (n=167). Ambulatory blood pressures, anthropometric measurements and biochemical indicators were recorded. PCR was used to characterize Clock genotypes (T/C); PCR and RFLP was employed to characterize Bmal1 genotypes (A/G). ELISA was used to detect Plasma PAI-1 levels.

**Results:** (1) Compared with control group, high PAI-1 group had higher waist circumferences, BMI, TG, IR and night systolic hypertension incidence (P<0.05), had lower HDL-C (P=0.008). There were no significant differences in ages, sex, TC, LDL-C, FBG, glycohemoglobin, ambulatory blood pressure monitoring data, sleep disorder and night diastolic hypertension incidence. (2) Gene polymorphisms: (1) Compared with control group, Clock gene CC and CT genotypes distribution frequency were higher in high PAI-1 group ( $\chi^2=19.67$ , P<0.001), and C allelic frequency was also higher in high PAI-1 group ( $\chi^2=46.72$ , P<0.001). (2) Compared with control group, high PAI-1 group had higher Bmal1 gene GG genotype distribution frequency ( $\chi^2=15.04$ , P=0.001), and also had higher G allelic frequency ( $\chi^2=34.70$ , P=0.001). (3) Combined effects of Clock and Bmal1 genes: There were four kinds of genotype combinations (CC/CT-GG, CC/CT-AA/AG, TT-GG, TT-AA/AG) according to  $\chi^2$  test results, and the compositions of genotype combinations were different between high PAI-1 group and control group ( $\chi^2=30.01$ , P<0.001). Only Clock C allelic and Bmal1 GG genotype combination (CC/CT-GG) distribution frequency were more in high PAI-1 group than control group by partitions of  $\chi^2$  method (P<0.0071). (3) Analyze risk factors of elevated plasma PAI-1: Clock and Bmal1 genotypes were independent risk factors of elevated plasma PAI-1 whereas all these combinations of Clock and Bmal1 genotypes did not enter into the regression equation by logistic regression. For Clock gene, minor C allele carriers (CC/CT) had a 2.5 higher risk of elevated PAI-1 than did noncarriers (OR=2.494, 95% CI 1.450~4.289, P=0.001). For Bmal1 gene, GG genotype subjects had a 2.4 higher risk of elevated PAI-1 than did A carriers (AA/AG) (OR=2.386, 95% CI 1.435-3.966, P=0.001). Clock and Bmal1 polymorphisms had not significant interaction effects on plasma PAI-1 levels.

**Conclusions:** Clock and Bmal1 genes polymorphisms were independent risk factors of elevated plasma PAI-1 in hypertensive patients. The innovation fund project of Fujian Province Health Department (No: 2012-CXB-5).

#### GW25-e1472

##### A Comparative Study of Right Adrenal Venous Sampling with and without 3 Dimensional Reconstruction

lin kaiyang, zhang zhujie, zhang jiaxin, zhang deliang, chen hui

Hypertension Laboratory, Fujian Provincial Cardiovascular Disease Institute, Provincial Clinical College of Fujian Medical University, Fuzhou, Fujian

**Objectives:** Adrenal venous sampling (AVS) is recommended as the gold standard procedure for subtype classification in PA, but the procedure is challenging and the right adrenal vein (RAV) particularly difficult to cannulate because it is short, variable and enters the inferior vena cava (IVC) at an acute angle. Our purpose was to find a feasible method in right adrenal venous cannulation by using MDCT with three dimensional reconstruction before AVS.

**Methods:** From August 2013 to April 2014, a total of 20 patients with confirmed PA who had a unilateral or bilateral adrenal morphology abnormalities (including hyperplasia or adenoma which diameter <1cm) underwent AVS were analyzed retrospectively. 7 of the patients used MDCT with 3 dimensional before AVS, the other 13 patients without using MDCT with 3 dimensional before AVS served as controls. To compare the rate of correct cannulation, contrast volume used, and time of right adrenal venous sampling between two groups above. Successful adrenal vein catheterization is defined by a ratio of >3:1 of cortisol in the adrenal vein vs the inferior vena cava.

**Results:** As compared to controls, using MDCT with three dimensional reconstruction before AVS increased the rate of correct cannulation into RAV from 23.1% to 85.7% (P<0.05), decreased the contrast volume about 1/3 (23±4 vs 60±18, P<0.05) and shortened the time to identify RAV by 50% (14.2±3.1 vs 29.7±6.8, P<0.05). By contrast MDCT with three dimensional reconstruction and angiography, 7 patients catheter misplacement lead to failure of right adrenal venous sampling before using MDCT.

**Conclusions:** MDCT with three dimensional reconstruction used before AVS might provide visual confirmation of correct cannulation, decrease the contrast volume, shorten the time to identify RAV, and improve success rates of RAV sampling.

The natural science foundation of Fujian Province (No: 2014Y01010261).

#### GW25-e1517

##### Blood Pressure Circadian Rhythm Impact on Early-stage Renal Damage in Patients with Hypertension

Kuang Zemin<sup>1,3</sup>, Hongjuan Hu<sup>2</sup>, Yu Kong<sup>1</sup>, Yu Zhengqiu<sup>1</sup>, Yuan Hong<sup>3</sup>

<sup>1</sup>Department of Hypertension, Beijing Anzhen Hospital of Capital Medical University,

<sup>2</sup>School of Nursing, Central South University, <sup>3</sup>Department of Cardiology, the Third Xiangya Hospital, Central South University

**Objectives:** To explore the relationship between blood pressure circadian rhythm and early-stage renal damage patients with hypertension.

**Methods:** 513 untreated patients with hypertension for 24h ambulatory blood pressure monitoring, all patients went through routine blood biochemical and determination of urine trace albumin. Patients were grouped dipper, non-dippers, reverse-dipper, early-stage renal function indexes were analysed on the influence of different blood pressure circadian rhythm.

**Results:** 5.26% patients for the rhythm of reverse-dipper. Compared with the wild type rhythm group (non-dippers, dippers), reverse-dipper group has more ACR (181.66±48.23 vs 45.00±34.08 vs 16.13±10.60, P<0.001), lower eGFR (93.61±16.38 vs 104.96±24.48 vs 106.27±25.18, P=0.04). Compared with the dipper group, reverse-dipper group has higher CPP, 24h average SBP, nSBP, nDBP, nPP. Compared with non-dipper rhythm group, reverse-dipper group has higher nSBP, nDBP, nPP. Multiple regression analysis showed, adjusted for age, gender, BMI, clinic blood pressure, 24h ambulatory blood pressure, reverse-dipper circadian rhythm is one type predictor of ACR occurred.

**Conclusions:** Abnormal blood pressure circadian rhythm is the important factor causing the early-stage renal damage, reverse-dipper make early-stage renal damage are more significant. Nighttime systolic blood pressure levels and blood pressure circadian rhythm has important clinical significance for early-stage renal damage in patients with hypertension.

#### GW25-e2259

##### Correlations between Cardiac Autonomic Function and Arterial Stiffness in Essential Hypertension

Wang Jingrong, Jiang Yinong, Lu Yan, Zhang Ying, Yang Yanzong, Liu Ying

The First Affiliated Hospital of Dalian Medical University

**Objectives:** Autonomic nervous system modified simultaneously heart rate, heart rate variability (HRV) and blood pressure, blood pressure variability (BPV). Studies have shown that chronic sympathetic activity can aggravate target organ damage in essential hypertension (EH). The study aims to investigate the association between cardiac autonomic function and arterial stiffness in essential hypertension (EH).

**Methods:** The 275 patients (mean age 56.6±13.4 years; 49% males) with EH admitted to cardiovascular ward in the First Affiliated Hospital of Dalian Medical University from April 2011 to January 2014 were enrolled in this study. Large artery stiffness was assessed by measurement of carotid-femoral pulse wave velocity (PWV). Subjects were divided into normal PWV group (PWV<9m/s, n=185) and high PWV group (PWV≥9m/s, n=90) according to PWV values. Synchronic 24h ambulatory blood pressure monitoring (ABPM) and dynamic electrocardiogram (Holter) were performed for all participants. Cardiac autonomic function was assessed by synchronic 24h HRV and BPV.

**Results:** All measures in high PWV group showed abnormalities of both HRV and BPV patterns. There were increased 24-hour systolic blood pressure standard deviation (24h SSD) (13±3.5 mmHg vs 14.4±3.6 mmHg, P<0.01) and decreased standard deviation of the average of all normal-to-normal intervals in all 5-minute intervals (SDANN) (194.4±119.3 mmHg vs 159.7±66.5 mmHg, P<0.01) in the high PWV group. The HRV analysis revealed that SDANN significantly decreased and LF, HF, LF/HF increased in high PWV group (P<0.05). Analyzing the data of ABPM showed that 24hSBP, dSBP, nSBP, 24hPP, dPP, nPP, 24hSSD, dSSD, nSSD in high PWV group are significantly higher than normal PWV group (P<0.01). Systolic blood pressure fall (SBPF) in high PWV group are significantly lower than normal PWV group (5.05±8.32 mmHg vs 9.93±7.35 mmHg, P<0.01). Meanwhile the detection rate of non-dippers in high PWV group is higher than normal PWV group (71.2% vs 55.7%, P<0.01). Night/day heart rate ratio in high PWV group are significantly higher than normal PWV group (0.9±0.08 vs 0.87±0.06, P<0.01). Multiple linear regression analysis showed that PWV is independently correlated with 24hSSD, 24hPP, LF, LF/HF and Night/day heart rate ratio, in which LF has the strongest correlation.

**Conclusions:** The synchronic study of HRV and BPV found HRV decreased and BPV elevated in high PWV group. Sympathetic nervous system activity (LF) and autonomic nervous system dysfunction (LF/HF) increase are independent factors of arterial stiffness in patients with EH. Night/day heart rate ratio may be an easy way to reflect autonomic nervous function and can forecast the arterial stiffness in patients with EH.