(27.2±9.2 vs 20.9±8.2 kg/m^2, P<0.05), waist to hip ratio (0.89±0.05 vs 0.68±0.34, P<0.05), alcohol intake (22.22% vs 2.78%, P<0.05) and creatinine level (58.65±11.16 vs 47.83±5.65μmol/l, P<0.01).
Conclusions: A progressively early onset of hypertension by generation could be observed in MIEH pedigree patients. Hereditary factors on the top of environmental and clinical risk factors of hypertension may attribute to the early onset of MIEH.

GW25-e3417

The relationship between carotid-femoral pulse wave velocity and severity of coronary artery disease

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Objectives: To evaluate the value of carotid-femoral pulse wave velocity (cfPWV) for predicting severity of coronary artery disease measured as SYNTAX score.
Methods: Three hundred and nineteen patients who underwent primary angiography as well as cfPWV measurements were enrolled. SYNTAX scores were assessed according to the angiographic results. Patients were divided to control group (no ≥50% stenosis in coronary artery), low SYNTAX score (1-17.5) group, and high SYNTAX score (18-72) group. Ordinal logistic regression analysis was used to evaluate the association between cfPWV and SYNTAX score. ROC was used to assess the accuracy of cfPWV to predict SYNTAX score.
Results: After adjusting for age, sex, obesity, smoking, family history of cardiovascular diseases, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, ankle-brachial index (ABI), hypertension, hyperlipemia, and diabetes, cfPWV was associated with the SYNTAX score (odds ratio=1.24, P=0.006). cfPWV showed relatively high accuracy to predict SYNTAX score ≥33 (area under ROC=0.703).
Conclusions: Aortic stiffness measured as cfPWV is associated with SYNTAX score, which shows clinical value for predicting the severity of coronary atherosclerosis.

GW25-e4118

The Relationship between Folic acid, Vitamin B12, Blood Pressure Variability and the Degree of Cysteine

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Objectives: To investigate the relationship between folic acid,vitamin B12,24-hour ambulatory blood pressure variability and cysteine.
Methods: 60 patients (36 males and 24 females) who suffered from high blood pressure were recruited. Clinical characteristics were recorded, the value of folic acid,vitamin B12 and cysteine were measured. According to the level of cysteine, 60 patients were divided into high cysteine group (Hcy>15.4 ummo/L) and low cysteine group (Hcy<15.4 ummol/L).Meanwhile we observed the patients' blood pressure for 24 hours and got the index of blood pressure variability, which was indicated by 24-hour systolic blood pressure, diastolic blood pressure, and the average pressure standard derivation etc. SPSS software was used to analyze the relationship of above indexes.
Results: (1) The test showed that the difference of folic acid and vitamin B12 level between high cysteine group and low cysteine group was statistically significant (P=0.01 and P=0.0001 respectively). So it was the standard derivation of the 24-hour systolic blood pressure, the daytime systolic blood pressure, the daytime diastolic blood pressure, the nighttime diastolic blood pressure, the 24-hour average pressure (P=0.041, P=0.032, P=0.01, P=0.016 and P=0.006 respectively). (2) According to the results of Logistic regression analysis, the degree of cysteine was associated with that of folic acid, vitamin B12, coronary heart disease, and the standard derivation of the the 24- hour systolic blood pressure, the daytime systolic blood pressure, the nighttime systolic blood pressure, the nighttime average pressure (P=0.034, P=0.005, P=0.045, P=0.014, P=0.026, P=0.012 and P=0.041, respectively).
Conclusions: (1) There was a negative correlation between the degree of folic acid and vitamin B12 and that of cysteine.(2) There was a positive correlation between the degree of cysteine and the standard derivation of the 24-hour systolic blood pressure, the daytime systolic blood pressure, the nighttime systolic blood pressure, the nighttime average pressure. (3) Coronary heart disease was correlated with the degree of cysteine.

GW25-e2460

Correlationship of Vascular Disease with Plasma Levels of esRAGE and PTX3 in Elderly Hypertensive Patients

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Objectives: To investigate the association between pentraxin-3 (PTX3), endogenous secretory advanced glycation end products receptor (esRAGE) levels and arterial elasticity in elderly hypertensive patients.
Methods: The elderly hypertensive patients who hospitalized at the PLA 252 Hospital from July 2013 to January 2014 were divided into hypertension group, hypertensive heart disease group and control group. Hypertension group was divided into simple hypertension group, hypertension +coronary heart disease (CHD) group, hypertension +diabetes group, hypertension+CHD+diabetes group. Plasma PTX3 and esRAGE levels were determined by enzyme linked immunosorbent assay (ELISA). Brachia-ankle pulse wave velocity (BA-PWV) and ankle brachial index (ABI) were measured using a volume plethysmographic apparatus. Mean arterial pressure, pulse pressure, age, sex, PTX3, esRAGE, blood lipid and blood glucose were measured in all patients.
Results: (1) Plasma PTX3 concentration was significantly higher in hypertensive heart disease group than that in simple hypertension group and control group, while no statistically significant difference between simple hypertension group and control group. PTX3 in hypertension+CHD+diabetes group was markedly higher than simple hypertension group and hypertension+CHD group ($P<0.05$). (2) Plasma esRAGE in hypertensive heart disease group was significantly lower than simple hypertension group and control group ($P<0.05$). Plasma esRAGE was significantly lower in simple hypertension group compared to control group ($P<0.05$). (3) PWV was markedly higher in simple hypertension group than control group, while ABI was significantly lower ($P<0.05$). PWV and ABI were significantly different in hypertensive heart disease compared with that in simple hypertension group ($P<0.05$). There was significant difference between PWV and ABI in hypertension grade 1 and 2 ($P<0.05$), while no significant difference between PWV and ABI in hypertension grade 2 and 3. The levels of PWV in the group of blood pressure not achieved the target goal were higher than the group of blood pressure achieved the target goal and control group ($P<0.05$). PWV in simple hypertension group was markedly lower than hypertension +diabetes group and hypertension+ CHD +diabetes group, while ABI was significantly higher ($P<0.05$). (4) Relevant analysis revealed correlation with PWV and ABI for mean arterial pressure, pulse pressure, age, sex, PTX3, esRAGE, blood lipid, blood glucose.
Conclusions: Artery structure and function experienced markedly changes in elderly hypertensive patients, and metabolic risk factors made it worse. PTX3 and esRAGE play pivotal roles in the development of atherosclerosis in elderly hypertensive patients. They may serve as sensitive predictors for the change of cardiovascular morphology and hypertension target organ damage.

GW25-e0059

The relationship between abnormal orthostatic blood pressure changes with arterial stiffness and transient heart rate change

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Objectives: To elucidate the mechanisms of orthostatic hypotention (OH) and orthostatic hypertension (OHT).
Methods: The data were collected in 1010 participants who attend the general health examination in a Community Health Center. The data includes the general clinical information (e.g. sex, age, smoking status, physical activity, alcohol consumption levels),two arterial stiffness indicators: baPWV (brachial-ankle pulse wave velocity) and AI (augmentation index), as well as simultaneously measured blood pressure change and heart rate change when the participants made body movement from supine position to orthostatic position.
Results: According to the postural blood pressure changes, all the participants were divided into three groups including orthostatic normotension (ONT), OH and OHT groups. Compared to the ONT group, subjects in OH group were older and had higher values of systolic blood pressure (SBP), branchial-ankle pulse wave velocity (baPWV) and augmentation index (AI), but there were no difference in other traditional cardiovascular risk factors between the two groups. Otherwise, all the parameters did not differ between OHT and ONT group. Logistic regression analysis revealed that both baPWV (β=1.189, 95% CI 1.115-1.268) and AI (β=1.028, 95% CI 1.002-1.056) were independent risk factors for OH (Hosmer&Lemeshow test: P=0.601). Significant heart rate increase only played a role in DBP elevated when standing.
Conclusions: Arterial stiffness measurements such as baPWV and AI are independently risk factors for OH better than age and SBP. There is not any relationship between arterial stiffness and OHT while heart rate change, or said, sympathetic tone, is mainly responsible for DBP changes when standing.

GW25-e0067

Visit-to-visit variability of systolic blood pressure correlated with arterial stiffness in pre-hypertension

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Objectives: The aim of this study was to investigate the relationship between the visit-to-visit variability of systolic blood pressure (SBP) and arterial stiffness identified in patients with pre-hypertension.
Methods: Two hundred and forty-nine pre-hypertensive subjects were randomized into 4 groups (telmisartan, indapamide, compound hypoensive table and placebo) and received 3-year follow-up with 13 scheduled study visits. The coefficient of variation (CV) of BP was measured. Arterial stiffness was evaluated at baseline and the end of study by using carotid-radial pulse wave velocity (crPWV) and aortic augmentation index at heart rate of 75 bpm (Aix@75).
Results: Decling amplitude of crPWV was negatively correlated with CV of SBP (r=-0.578, P<0.001) and positively correlated with delta SBP (r=0.241, P<0.001). Decling amplitude of Aix@75 was negatively correlated with CV of SBP (r=-0.558, P<0.001) and positively correlation with delta SBP (r=0.203, P<0.001). After 3-year intervention, CV of SBP, crPWV and Aix@75 were significantly decreased in telmisartan, indapamide and compound hypoensive groups compared with placebo

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

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Objectives: To explore the relationship between plasm 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 less 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 plasm 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 Plasm PAI-1 levels.
Results: (1) Compared with control group, high PAI-1 group had higher waist circumferences, BIM, 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 (χ^2=19.67, P<0.001), and C allelic frequency was also higher in high PAI-1 group (χ^2=46.72, P<0.001).(2)Compared with control group, high PAI-1 group had higher Bmal1 gene GG genotype distribution frequency (χ^2=15.04, P=0.001), and also had higher G allelic frequency (χ^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 χ^2 test results, and the compositions of genotype combinations were different between high PAI-1 group and control group (χ^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 χ^2 method (P<0.0071). (3) Analyze risk factors of elevated plasm PAI-1: Clock and Bmal1 genotypes were independent risk factors of elevated plasm 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 plasm PAI-1 levels.
Conclusions: Clock and Bmal1 genes polymorphisms were independent risk factors of elevated plasm 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

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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 paitients 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.
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GW25-e1517

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

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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 analysised 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

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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.