

healthy subjects were enrolled as healthy control group (HEALTHY). The demographic, biochemical and clinical data as well as endothelial function was examined. Plasma MIF was measured using ELISA kits as described previously. In order to find the influencing factor of MIF, we performed correlation analysis between plasma MIF levels and clinical characteristics. To explore the functional significance of elevated plasma MIF in HTN-HLP patients, we treated HUVECs with pooled plasma of HTN-HLP and HEALTHY groups. The protein levels of adhesion molecules VCAM-1 and ICAM-1 were examined 6 hours after treatment.

RESULTS We found that plasma MIF was significantly elevated in the HTN-HLP group comparing with HEALTHY group (65.60 ± 44.35 pg/ml vs 26.63 ± 10.85 pg/ml, $p < 0.001$). Serum NO (nitric oxide) (19.10 ± 1.71 nmol/ml vs 33.82 ± 2.50 nmol/ml, $p < 0.001$) and eNOS (endothelial nitric oxide synthase) (17.68 ± 1.85 U/ml vs 31.25 ± 2.77 U/ml, $p < 0.001$) levels were significantly lower in HTN-HLP group. Serum ET-1 (endothelin-1) levels were significantly higher in HTN-HLP group comparing with HEALTHY group (95.44 ± 3.16 pg/ml vs 43.15 ± 3.09 pg/ml, $p < 0.001$). Furthermore, in the combined population of HTN-HLP and HEALTHY groups, SBP ($R^2 = 0.198$, $p < 0.001$), DBP ($R^2 = 0.216$, $p < 0.001$), left baPWV (brachial-ankle pulse wave velocity) ($R^2 = 0.122$, $p = 0.007$), right baPWV ($R^2 = 0.129$, $p = 0.005$) and ET-1 ($R^2 = 0.248$, $p < 0.001$) were significantly positively correlated with plasma MIF levels, NO ($R^2 = -0.184$, $p < 0.001$) and eNOS ($R^2 = -0.230$, $p < 0.001$) were significantly negatively correlated with plasma MIF levels. Plasma from HTN-HLP significantly stimulated VCAM-1 ($p = 0.002$) and ICAM-1 ($p = 0.01$) protein expression on the surface of HUVECs.

CONCLUSIONS Plasma MIF was elevated in HTN-HLP patients, and positively correlated with blood pressure and early atherosclerosis parameters, negatively correlated with endothelial function parameters. Plasma from HTN-HLP significantly stimulated adhesion molecules expression, MIF may act as biomarker for HTN-HLP patients.

GW26-e1251

The relationship of retinal vessel diameters and fractal dimensions with blood pressure and cardiovascular risk factors

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OBJECTIVES This study aimed to investigate the correlation between quantitative retinal vascular parameters such as central retinal arteriolar equivalent (CRAE) and retinal vascular fractal dimension (Df), and cardiovascular risk factors in the Chinese Han population residing in the islands of southeast China.

METHODS In this cross-sectional study, fundus photographs were collected and semi-automated analysis software was used to analyze retinal vessel diameters and fractal dimensions. Cardiovascular risk factors such as relevant medical history, blood pressure (BP), lipids, and blood glucose data were collected.

RESULTS Subjects had a mean age of 51.9612.0 years and included 812 (37.4%) males and 1,357 (62.6%) females. Of the subjects, 726 (33.5%) were overweight, 226 (10.4%) were obese, 272 (12.5%) had diabetes, 738 (34.0%) had hypertension, and 1,156 (53.3%) had metabolic syndrome. After controlling for the effects of potential confounders, multivariate analyses found that age ($\beta = 0.06$, $P = 0.008$), sex ($\beta = 1.33$, $P = 0.015$), mean arterial blood pressure ($\beta = -0.12$, $P < 0.001$), high-sensitivity C-reactive protein ($\beta = -0.22$, $P = 0.008$), and CRVE ($\beta = 0.23$, $P < 0.001$) were significantly associated with CRAE. Age ($\beta = -0.0012$, $P < 0.001$), BP classification (prehypertension: $\beta = -0.0075$, $P = 0.014$; hypertension: $\beta = -0.0131$, $P = 0.002$), and hypertension history ($\beta = -0.0007$, $P = 0.009$) were significantly associated with Df.

CONCLUSIONS Df exhibits a stronger association with BP than CRAE. Thus, Df may become a useful indicator of cardiovascular risk.

GW26-e1300

Decreased Neupilin-1 Expression in Hypertensive and Hypertensive Diabetic Patients

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OBJECTIVES To detect the changes of plasma levels of neupilin-1 and catalase in hypertensive and hypertensive diabetic patients. And to explore the correlation between neupilin-1 and catalase in the whole study population.

METHODS In this cross-sectional study, eighty-eight participants were enrolled, which were divided into hypertensive group ($n = 31$), hypertensive diabetic group ($n = 31$) and control group ($n = 26$). Blood pressure was obtained from each participant with mercury sphygmomanometer. The expressions of neupilin-1 and catalase were measured by ELISA. Serum lipid profile, glucose and glycosylated hemoglobin A1c (GHbA1c) levels were also detected.

RESULTS The levels of total cholesterol (TC) and body mass index (BMI) were significantly higher in the hypertensive group than those in control group ($P < 0.05$). The levels of TC, triglyceride (TG), low density lipoprotein cholesterol (LDL-C), BMI, waist circumference were significantly higher in the hypertensive diabetic group than those in control group ($P < 0.05$). The mean plasma levels of neupilin-1 and catalase in both hypertensive diabetic group and hypertensive group was significantly decreased compared to that in the normal group ($P < 0.05$). While the mean plasma levels of neupilin-1 and catalase in hypertensive diabetic group were significantly decreased compared to the hypertensive group ($P < 0.05$). Moreover, a significantly positive correlation between neupilin-1 and catalase in the whole study population ($P < 0.05$) were observed.

CONCLUSIONS Neupilin-1 expression is decreased in both hypertensive and hypertensive diabetic patients, and more decreased in hypertensive diabetic patients. Decreased neupilin-1 level may be associated with to the reduction of catalase.

GW26-e1451

The potential risks of blood pressure variations in essential hypertensive patients under treatment: a cross-sectional survey

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OBJECTIVES Recent studies of our group indicated that blood pressure (BP) variation might serve as an independent risk factor for lacunar infarction and carotid atherosclerosis in non-treated essential hypertensive patients. However, the potential risk of non-dipper pattern of BP in individuals under treatment remains unclear. This study was established to investigate the relationship between 24 hours variations of BP and carotid atherosclerosis in essential hypertensive patients with normal BP under treatment.

METHODS A total of 327 hypertensive patients were continuously recruited from April 2012 to June 2013. All the individuals underwent ambulatory blood pressure monitoring (ABPM) and carotid ultrasound while in hospital. These patients were divided into "carotid plaque" group ($n = 199$) and "non-plaque" group ($n = 128$), based on whether the thickness of all the cross-sectional areas of each plaque ≥ 1 mm in diameter found in all carotid vessels or not. According to the nocturnal fall of systolic and/or diastolic BP (SBP and/or DBP), circadian BP pattern was divided as dipper (10~20% nocturnal fall of BP in SBP and DBP) and non-dipper (<10% or >20% nocturnal fall of BP in SBP or DBP). Additionally, average levels and nocturnal BP falls of SBP and DBP, as well as blood cholesterol, diabetes mellitus, smoking and menopause status were examined as risk factors for carotid plaque. Logistic regression was used to analyze the relationship between those risk factors and carotid plaque.

RESULTS Patients with carotid plaque were older ($p < 0.001$) and had higher SBP in night-time ($p < 0.001$), but less nocturnal BP falls of SBP ($p = 0.001$) and DBP ($p < 0.01$) than patients without carotid plaque. Moreover, the plaque group were found to have more non-dipper and diabetes patients ($p < 0.05$). Except age ($p < 0.01$) and sex ($p < 0.05$), non-dipper pattern of BP (OR=1.727, 95%CI 1.015-2.940, $P < 0.05$), circadian decline rate of SBP (OR=0.958, 95%CI 0.925-0.993, $P < 0.05$) and the level of SBP at nighttime (OR=1.027, 95%CI 1.006-1.048, $P < 0.05$) was associated with carotid plaque separately.

CONCLUSIONS The non-dipper pattern of BP, as well as circadian decline rate of SBP and the level of SBP at nighttime may serve as independent risk factors for carotid plaque in essential hypertensive patients under treatment, respectively. Therefore, other than target BP level, BP dipper pattern should also be considered in antihypertensive treatment in future clinical practice.

GW26-e1547

Relationship between blood pressure variability and ankle brachial index in people aged 80 and over

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OBJECTIVES Objective To investigate the relationship between pressure variability and ankle brachial index in people aged 80 and over

METHODS A total of 111 people aged 80 and over were divided into two groups according to the ABI: low ABI group ($ABI \leq 0.9$, $n = 56$) or normal ABI group ($ABI > 0.9$, $n = 55$). Then they were divided into two groups according to the blood pressure: Hypertension group (HG, $n=48$) or normal group (NG, $n=63$). Ambulatory blood pressure monitoring was performed for all patients.

RESULTS 24h mean diastolic blood pressure (24hDBP) [66.25 ± 11.20 mmHg vs (70.11 ± 8.81) mmHg], day mean diastolic blood pressure (dDBP) [67.25 ± 7.81 mmHg vs (70.68 ± 8.70) mmHg], night mean diastolic blood pressure (nDBP) [64.65 ± 12.08 mmHg vs (69.16 ± 10.00) mmHg] were significantly lower in low ABI group than in normal ABI group, 24 hour systolic blood pressure variability (24hSBPV) [12.80 ± 2.66 mmHg vs (14.14 ± 3.64) mmHg] were significantly lower in low ABI group than in normal ABI group, night mean systolic blood pressure variability (nSBPV) [11.99 ± 4.19 mmHg vs (9.97 ± 4.05) mmHg] were significantly higher in low ABI group than in normal ABI group. (all $P < 0.05$). 24hSBPV [14.87 ± 3.91 mmHg vs (13.20 ± 3.41) mmHg], nSBPV [12.27 ± 5.50 mmHg vs (10.33 ± 3.93) mmHg] were higher in HG than NG, ABI [0.98 ± 0.21] vs (1.07 ± 0.20) were lower than NG ($P < 0.05$).

CONCLUSIONS 24hDBP, dDBP, nDBP, 24hSBPV, nSBPV may be the risk factors of low ABI in people aged 80 and over. nDBP, nSBPV is an independent risk factor.

GW26-e2109

Blood pressure profile, left ventricle remodeling and endothelial dysfunction in patients with arterial hypertension and COPD

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OBJECTIVES Chronic overload of the left ventricle in hypertension leads to structural and morphological reorganization of the myocardium, which combines the concept of "remodeling", which is characterized by the presence of hypertrophy, dilatation and changes in the geometry of the heart cavities and myocardium as a whole, and ultrastructure of myocardium, which is ultimately remodeling of the myocardium and the integral substrate that determine the occurrence and progression of heart failure.

To evaluate the relationship of endothelial dysfunction with blood pressure (BP) daily profile and type of left ventricle (LV) remodeling in hypertensive patients with COPD.

METHODS We examined 120 patients with arterial hypertension and COPD. Assessment of systolic and diastolic LV function, condition vasomotor endothelial function using Doppler brachial artery during reactive hyperemia and drug, HD11XE-Phillips, US. Daily BP monitoring was carried out for 24 hours on CardioTens-01-Meditech, Hungary.

RESULTS Analysis of vasomotor function in patients with BP profiles showed that the diameter of the brachial artery was the greatest in patients with profile type night-peaker, and was $4.25(3.80;5.00)$, followed by patients with non-dipper - $4.20(3.70;4.60)$, dipper - $4.10(3.50;4.65)$ mmHg, reduced and most patients over-dipper, while the velocity of the blood was reduced in patients with night-peaker - $0.60(0.53;0.84)$ m/s.

Vasodilatatory reaction during decompression was the least pronounced in night-peaker patients - $5.47(3.04;11.72)\%$ ($p < 0.00014$), in non-dipper patients - $11.63(7.76;18.92)\%$, dipper - $8.94(7.04;15.46)\%$, over-dipper - $7.24(5.82;13.32)\%$.

Vasodilatatory response to nitroglycerin was preserved in most patients with non-dipper, accounting for $16.6(10.52;25.00)\%$, night-peaker - $13.67(8.01;20.24)\%$, over-dipper - $11.72(7.54;17.08)\%$, and decreased in dipper - $9.97(7.04;15.46)\%$.

Evaluation of correlation of endothelial dysfunction and indices of LV structural and functional properties showed that there is an inverse correlation between endothelial dysfunction in the form of reduced vasodilatatory effects on diagnostic tests and concentric hypertrophy ($r = -0.32$, $p = 0.001$), type of BP non-dipper ($r = -0.27$, $p = 0.009$), degree of night reduction in diastolic BP ($r = -0.25$, $p = 0.014$), systolic index ($r = -0.25$, $p = 0.016$), performance dilatation of brachial artery with nitroglycerin ($r = -0.24$, $p = 0.017$), normal LV geometry ($r = -0.22$, $p = 0.026$), the type of dipper ($r = -0.22$, $p = 0.032$), degree of night reduction in systolic BP ($r = -0.22$, $p = 0.030$), speed E ($r = -0.21$, $p = 0.037$).

Direct correlation was between of endothelial dysfunction degree and diastolic dysfunction degree ($r = 0.37$, $p = 0.00038$), concentric remodeling ($r = 0.25$, $p = 0.023$), eccentric hypertrophy ($p = 0.015$; $p = 0.02$), restrictive type of diastolic dysfunction ($r = 0.25$, $p = 0.026$), normal LV geometry ($r = 0.21$, $p = 0.036$), type of night-peaker ($r = 0.23$, $p = 0.026$), LV systolic dysfunction ($r = 0.21$, $p = 0.036$).

CONCLUSIONS Endothelial dysfunction is a factor of correlation with LV myocardial remodeling by concentric type, and with the change of BP circadian rhythm as night-peaker in hypertensive patients with COPD.

GW26-e2241

The co-existence of endothelial dysfunction and mild renal dysfunction synergistically increases the extent of left ventricular hypertrophy in hypertensive patients

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OBJECTIVES The association between impaired renal function and increase left ventricular mass was shown to be related to increase in arterial stiffness, which indicates that vascular homeostasis and remodeling may impact the left ventricular hypertrophy (LVH) in patients with renal dysfunction.

METHODS We measured the peripheral arterial reactive hyperemia index (RHI) and estimated glomerular filtration rate (eGFR) in 317 hypertensive patients comprising 115 normal RHI ($RHI > 1.67$) and normal eGFR ($eGFR \geq 90$ ml/min per $1.73m^2$), 136 low RHI ($RHI \leq 1.67$), 27 low eGFR ($60 \leq eGFR < 90$ ml/min per $1.73m^2$) and 39 low RHI combined with low eGFR.

RESULTS Multivariate logistic regression analysis identified lg RHI (odds ratio [OR]: 0.001, 95% confidence interval [CI]: 10^{-6} to 0.426, $p = 0.024$) and lg eGFR (OR: 0.009, 95% CI: 10^{-4} to 0.414, $p = 0.016$) as independent factors correlated with LVH respectively in hypertensive patients. Compared with normal RHI and eGFR patients, the extent of LVH in patients with either low RHI (OR: 1.224 95% CI: 0.451 to 3.327, $p = 0.691$) or low eGFR (OR: 0.593 95% CI: 0.070 to 5.037, $p = 0.632$) did not significantly increased, while it increased significantly and synergistically in patients with low RHI combined with low eGFR (OR: 4.629 95% CI: 1.592 to 13.458, $p = 0.005$).

CONCLUSIONS The co-existence of endothelial dysfunction and mild renal dysfunction synergistically increased the extent of LVH in hypertensive patients.

GW26-e3542

Morning Blood Pressure Surge is Associated with Serum Brain Natriuretic Peptide in Essential Hypertensive Patients

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OBJECTIVES The phenomenon that blood pressure rises sharply in the morning is called "Morning Blood Pressure Surge" (MBPS). It has been shown to better reflect cardiovascular risk than mean BP in hypertensive patients. This study investigated the correlation of brain natriuretic peptide (BNP) to MBPS in patients with essential hypertension.

METHODS We included 538 hypertensive patients who had ambulatory blood pressure monitoring at our hospital from 2012 to 2014. We examined MBPS and assessed the serum BNP level at the baseline.

RESULTS Mean MBPS was 14.0 ± 10.8 . MBPS was positively correlated with age ($r = 0.341$, $P < 0.001$), body mass index ($r = 0.216$, $P = 0.012$) and log-transformed BNP ($r = 0.452$, $P < 0.001$), daytime augmentation index adjusted for heart rate ($r = 0.253$, $P = 0.012$). From the 25th to 75th quartile of MBPS, log-transformed BNP increased significantly ($P_{trend} < 0.001$). In multivariate linear regression analysis, MBPS was independently associated with age ($P = 0.01$), dipping status ($P < 0.001$) and logBNP ($P < 0.001$).

CONCLUSIONS MBPS was independently associated with serum BNP level in essential hypertensive patients.

GW26-e5380

Intervention treatment of intractable hypertension caused by the stenosis in an accessory renal artery: A Case presentation

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OBJECTIVES For renovascular hypertension, a main reason for intractable hypertension, renovascular intervention treatment by femoral artery is often performed clinically. However, reports on the accessory renal artery intervention treatment by brachial artery are uncommon.