

number of risk factors and the values of atherosclerosis parameters were examined by analysis of covariance (ANCOVA), adjusted with age as a covariate. E raised along with the increasing number of risk factors ( $P<0.05$ ).  $\alpha$ ,  $\beta$  and PWV decreased firstly then increased ( $P<0.05$ ), and no significant difference was observed in DC and CC ( $P>0.05$ ).

**Conclusions:** Both ultrasound RF-data technique and VTMM can be used to non-invasively and quantitatively assess the carotid artery elasticity. E is a sensitive and direct marker for detecting early stage atherosclerosis, whereas it cannot be achieved immediately. Elastic parameters obtained from ultrasound RF-data technique are less sensitive and yet acquired conveniently.

#### GW25-e5213

##### Study on the changes of echocardiography before and after training in volunteers

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**Objectives:** To investigate the changes of cardiac structure and function by echocardiography before and after 3 km military training in volunteers and explore the potential damage of large intensity training to cardiac structure and function.

**Methods:** 40 healthy volunteers who aged (20±2) years old were selected randomly. Detecting the ultrasonic cardiogram and recording the data the day before the training, then the ultrasonic cardiogram was tested and the data was recorded again immediately after the training which was required to complete in 15 minutes. Finally, those data was compared with each other such as the diameter of left atrium, the diameter of right pulmonary, the thickness of interventricular septal and left ventricular posterior wall, the left ventricular end diastolic diameter and ejection fraction.

**Results:** (1) After 3 km military training, the ejection fraction (EF) 65.29±2.91% increased markedly ( $P<0.001$ ) compared with the value 63.10±3.65% before the training. (2) The left atrium (LA) 31.24±2.62mm after 3 km military training increased significantly ( $P<0.001$ ) compared with 29.93±2.56mm before the training. (3) Compared with 17.82±1.86mm before 3 km military training, the right pulmonary artery (RPA) 20.37±1.45mm after the training increased obviously ( $P<0.001$ ). (4) There was no changes in the left ventricular end diastolic diameter (LVEDD), interventricular septal thickness (IVST) and left ventricular posterior wall (LVPW) ( $P>0.05$ ).

**Conclusions:** Large intensity training causes a compensatory increase of EF and an enlargement of left atrial. The long-term and repeated large intensity training may lead to pathological changes in cardiac structure and function. Whether the large intensity training will increase the potential damage to cardiac structure and function, we should do the further observing at a long time and consider other factors such as exercise intensity, exercise duration and exercise skills.

#### GW25-e5260

##### Prognosis of patients with non-significant coronary stenosis detected by coronary computed tomography angiography

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**Objectives:** Coronary computed tomography angiography (CTCA) is an important non-invasive diagnostic method, however data regarding prognosis of patients with non-significant coronary stenosis detected by CTCA is rare. The aim of our study was to evaluate the prognostic role of CTCA in patients with non-significant coronary stenosis.

**Methods:** Patients with suspected coronary artery disease underwent CTCA were enrolled and followed up clinically. Cardiovascular clinical endpoints were defined as MACE including cardiac death, non-fatal myocardial infarction and hospitalization due to chest pain. The relationship between MACE and baseline patient characteristics, stenosis severity and lesion characteristics was evaluated.

**Results:** A total of 847 patients were enrolled (mean age 61.7±12.7 years and 53.8% men). CTCA results showed normal in 61.3% patients, mild stenosis in 22.2% patients, and moderate stenosis in 16.5% patients. During follow up of 34.5±5.8 months, MACE rate was 2.0%. Multivariate COX hazard regression analysis showed that the severity of lesion in CTCA was the only factor to predict MACE (HR=5.64, 95% CI 2.69-11.87,  $P<0.001$ ). More MACE occurred in patients with coronary lesions than without coronary lesions ( $P<0.001$ ).

**Conclusions:** MACE rate in patients with non-significant coronary stenosis detected by coronary CTCA correlated well with the severity of lesion in coronary CTCA. MACE rate was very low in patients with normal and mild coronary lesion in CTCA.

#### GW25-e5308

##### Assessment of Adriamycin-Induced Cardiomyopathy by Strain and Strain Rate Imaging

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**Objectives:** Doxorubicin is a highly effective antineoplastic agent, but it can produce the serious side effects of acute cardiac injury and chronic congestive heart failure. Echocardiography is used as a non-invasive diagnostic technique to visualize morphologic or functional changes in doxorubicin-induced cardiomyopathy. But conventional measures of ventricular function, such as ejection fraction, fractional shortening, are insensitive in detecting early doxorubicin cardiac injury. The aim of our study was to validate if strain (S) and strain rate (SR) imaging, new technologies of echocardiographic diagnosis, are more sensitive indices to assess cardiac function in an experimental model of doxorubicin-induced cardiomyopathy.

**Methods:** Fifty-six New Zealand rabbits were randomly divided into four groups: group A, doxorubicin 1mg/kg; group B, 2mg/kg; group C, 3mg/kg; control group, 2 ml/mg of normal saline; all given intravenously once a week for 8 weeks (total dose, 8 mg/mg, 16 mg/mg, 24 mg/mg, respectively) to induce the cardiomyopathy model. The left ventricular dimensions, fractional shortening and ejection fraction were measured by transthoracic echocardiography on the baseline and in the 4, 6, 8, 12th week after administration. The parameters of peak systolic strain and strain rate at the mitral annulus were measured.

**Results:** Compared with the baseline conditions, the value for the left ventricular diameter of the diastole increased significantly, while the value for ejection fraction and the fractional shortening decreased significantly after given with doxorubicin ( $P<0.05$ ) for 6 weeks. For control group, no significant changes were found in all parameters. But at four weeks of doxorubicin administration, peak strain and strain rate at mitral annulus significantly decreased, there was a significant difference between group C and control group ( $P<0.05$ ). A progressive worsening occurred for group C at six weeks, as well as group B. The changes were supported by histologic findings.

**Conclusions:** Strain and SR imaging provides a new sensitive and early method to evaluate LV function in monitoring adriamycin cardiotoxicity compared to conventional echocardiography.

#### GW25-e0825

##### Noninvasive Assessment of Microvascular Function in Hypertension by Transthoracic Doppler Echocardiography

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**Objectives:** The present study aim at investigate the use of transthoracic Doppler echocardiography (TTDE) in coronary flow imaging (CFI) to evaluate the microvascular function in Hypertension.

**Methods:** 51 patients without significant coronary lesions detected by angiography were divided into two group, as hypertensive group (n=25) and normal control group (n=26). TTDE-CFI and adenosine stress echocardiography were used to measure average peak velocity at baseline and hyperemia, and the coronary flow velocity reserve (CFVR) were calculated.

**Results:** There were no significant difference in clinical baseline data between hypertensive group and normotensive control group, while blood pressure related parameters were significant higher in hypertensive group ( $P<0.01$ ). The coronary flow parameters between the two groups was no significant difference in the resting state and adenosine stress state, but CFVR was lower in hypertensive than that in normotensive control group (2.44±0.49 vs 3.33±0.40,  $P<0.0001$ ).

**Conclusions:** The reduction of CFVR is a effective and noninvasive assessment parameters of microvascular function in hypertension.

#### GW25-e1545

##### A study on myocardial shear strain by stress and live three-dimensional echocardiography

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**Objectives:** To evaluate myocardial shear strain by three - dimensional echocardiography.

**Methods:** 45 healthy volunteers including man 22 and women 23, aged mean (25.5±2.8) years were studied. All subjects underwent a multistage symptom-limited supine graded exercise protocol on a variable load bicycle ergometer. The entire test was divided into three: pre-, peak, after exercise. (1) Blood pressure (BP), heart rate (HR) and BP×HR (RPP) was measured during rest, peak exercise, and recovery stages. Through the apical 4 chamber view, a 2mm pulsed Doppler sample volume was placed at the mitral valve tip, and mitral flow parameters were obtained: peak velocity of early filling (E) and late (A) filling, and ratio of E over A. Furthermore, Doppler tissue imaging was carried out in the four-chamber view at the septal mitral annular level. The peak velocity of myocardial systolic wave (s), early diastolic wave (e) and late diastolic wave (a) were recorded; the e/a and