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### RELATIONSHIP OF ARTERIAL STIFFNESS AND LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN CORONARY HEART DISEASE PATIENTS WITHOUT MYOCARDIAL INFARCTION

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**Objectives** The carotid-femoral pulse wave velocity (cfPWV) has been regarded as a marker of arterial stiffness. The present study was conducted to evaluate the association between cfPWV and left ventricular diastolic dysfunction and its severity in coronary heart disease patients without myocardial infarction.

**Methods** From August 2010 until August 2011, we enrolled 243 patients who are hospitalised for performing coronary angiography. Among these in patients, who with ejection fraction  $\leq 50\%$ , heart failure, organic heart diseases, atrial fibrillation, acute myocardial infarction, peripheral arterial diseases, chronic obstructive pulmonary disease, renal insufficiency (serum creatinine  $> 1.5$  mg/dl) were excluded, the other 172 subjects were included. All patients' medical history and general clinical data were recorded. Blood sampling was performed in the morning after a 12 h overnight fast. In these patients, we sequentially measured echocardiography, cfPWV, carotid intima media thickness and coronary angiography. Left ventricular diastolic dysfunction was divided into four groups according to the results of echocardiography: 38 subjects with normal (Non-HFNEF), 45 subjects with mild dysfunction (Grade I), 57 subjects with moderate dysfunction (Grade II) and 32 subjects with severe dysfunction grade (Grade III). Based on the number of stenotic vessels on coronary angiography, these patients were divided into three groups: 1-vessel, 2-vessel and 3-vessel groups. Data was analysed using SPSS 11.5 software.

#### Results

1. The patients in diastolic dysfunction group were much older and had significantly higher prevalence of hypertension, diabetes mellitus, hyperlipemia and smoking together with higher body mass index compared with those in normal diastolic function group ( $p < 0.001$ );
2. There were significant differences in the severity of coronary heart disease between four groups, the number of affected coronary arteries was correlated with the severity of diastolic dysfunction ( $p < 0.001$ );

3. The transmission speed of carotid - femoral artery pulse wave, the film thickness of the carotid artery, the inner diameter of left atrium, the thickness of atrial septal basal segment and left ventricular wall as well as the left ventricular mass index were significantly increased with the exacerbation of diastolic dysfunction between four groups ( $p < 0.001$ ). There were also significant differences in the ultrasonography index such as E/A, E/E1 and Tei index that could indirectly reflect left ventricular diastolic function between four groups ( $p < 0.05$ );
4. There were significant differences in the transmission speed of carotid - femoral artery pulse wave between different groups with coronary heart disease ( $7.84 \pm 0.46$  vs  $10.25 \pm 1.34$  vs  $14.46 \pm 1.68$ ,  $p < 0.001$ );
5. cfPWV was positively correlated with E/E' ( $r = 0.851$ ,  $p < 0.001$ ), the film thickness of the carotid artery ( $r = 0.581$ ,  $p < 0.001$ ), the inner diameter of left atrium ( $r = 0.349$ ,  $p < 0.01$ ) and the left ventricular mass index ( $r = 0.256$ ,  $p < 0.01$ ).
6. The area under ROC of the transmission speed of carotid - femoral artery pulse wave to reflect left ventricular diastolic dysfunction was 0.908 (95% CI 0.995 to 1.000). If 8.65 m/s was selected as the cut-off value, the sensitivity and specificity to diagnose left ventricular diastolic dysfunction was 93.8% and 97.2%, respectively.

#### Conclusions

1. Old age, high blood pressure, diabetes, hyperlipidaemia, smoking and overweight were possible risk factors of diastolic dysfunction in patients with coronary artery disease.
2. The left ventricular diastolic function was declined following the increased severity of affected coronary arteries in patients with coronary heart disease.
3. The arterial stiffness was increased in patients with coronary heart disease, and correlated with the severity of coronary lesions.
4. The arterial stiffness was correlated with the severity of carotid atherosclerosis and left ventricular diastolic function in patients with coronary heart disease, which could independently reflect the severity of atherosclerosis and left ventricular diastolic dysfunction.