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## 21. THE ASSOCIATION OF BETWEEN CORONARY SPASM AND B-TYPE NATRIURETIC PEPTIDE AND PULSE WAVE VELOCITY

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both  $p < 0.001$ ), but there was no difference in aPWV between sexes. Peripheral and central Alx, and aortic PWV all increased significantly with age; however, the age-related changes in Alx ( $r = 0.333$ ,  $p < 0.001$ ) and aortic PWV ( $r = 0.194$ ,  $p < 0.001$ ) were non-linear, with Alx increasing more in younger individuals, whereas the changes in PWV were more prominent in older individuals, which were similar to the changes in Caucasians (The Anglo-Car-diff Collaborative Trial (ACCT)).

**Conclusion:** These data suggest that 1) there is sex-difference in Alx according to aging, 2) Alx might be a more sensitive marker of arterial stiffening and risk in younger individuals but aortic PWV is likely to be a better measure in older individuals.

#### 19.

##### AORTIC DISTENSIBILITY IS MORE CLOSELY ASSOCIATED WITH CAROTID INTIMA MEDIA THICKNESS THAN AORTIC INTIMA-MEDIA THICKNESS IN THE PATIENTS WITH ISCHEMIC STROKE

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**Background:** The aorta plays a central role for a modulator in whole cardiovascular system by its elasticity. If the elasticity was decreased, aortic distensibility was also decreased and stiffness index was elevated. In this study, we investigated the relationship between aortic distensibility calculated from descending thoracic aorta and intima media thickness (IMT) from aorta and carotid artery which was known as a surrogate marker for atherosclerosis and a predictor of cardiovascular events.

**Methods:** A total of 500 patients with acute ischemic stroke were enrolled in this study. Most of patients were performed transesophageal echocardiography for detection of embolic sources. We evaluated the association of arterial stiffness index, calculated by distensibility of descending thoracic aorta and systemic blood pressure, and aortic IMT as well as carotid IMT with age, sex, potential vascular risk factors, and cardiac function by echocardiography.

**Results:** Arterial stiffness index significantly correlated with IMT of descending thoracic aorta and carotid artery ( $r = 0.279$ ,  $p = 0.014$ ,  $r = 441$ ,  $p < 0.001$ ). It also correlated with age ( $r = 0.410$ ,  $p = 0.001$ ) and hypertension history ( $r = 0.341$ ,  $p = 0.003$ ). Arterial stiffness index significantly negative correlation with common carotid artery blood flow peak systolic velocity ( $r = -0.248$ ,  $p = 0.010$ ). A stepwise multivariate regression analysis demonstrate that arterial stiffness index was independently associated with carotid IMT ( $\beta = 0.308$ ,  $p = 0.013$ ), whereas aortic IMT was not an independent predictors of aortic distensibility.

**Conclusion:** Arterial stiffness index by using distensibility of descending thoracic aorta significantly correlates with other proven surrogate for atherosclerosis such as aortic and carotid IMT. Aortic distensibility is more closely associated with carotid IMT than aortic IMT in the Patients with Ischemic Stroke.

#### 20.

##### CORRELATION OF AORTIC DISTENSIBILITY WITH CORONARY ATHEROSCLEROSIS IN ANGINA PATIENTS

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**Background:** Arterial stiffness is associated with an increased risk of cardiovascular disease. However, limited evidence exists on whether arterial stiffening correlates not only with cardiovascular events, but also with subclinical atherosclerotic lesions. This study aimed to provide information on arterial stiffening by the measurements of distensibility at aortic site in angina patients in whom angiographic evaluation allowed quantification of coronary atherosclerosis.

**Methods:** We studied 137 patients with angina admitted to our hospital for coronary angiography. The measurements of aortic distensibility were carried out in the proximal ascending aorta, 3 cm from the origin of the aorta by a Echocardiography System (Acuson). Patients were classified into three groups according to the angiographic findings: nonsignificant coronary lesions (lumen narrowing  $< 50\%$ , group A); one (group B); and two or three (group C) coronary vessels.

**Results:** Age, previous cardiac disease and interventions were progressively greater or more common from group A to C. Other risk factors (serum cholesterol, smoking, history of hypertension) did not differ between the

three groups. Aortic distensibility decreased progressively from group A to C ( $2.41 \pm 1.77$ ,  $1.76 \pm 1.33$ ,  $1.62 \pm 1.09$  cm<sup>2</sup> dyne<sup>-1</sup> 10-6) The decrease in aortic distensibility from group A to group B and C remained significant after adjustment for variables that showed between-group differences such as gender, age, and systolic pressure and showed it to be a specific marker of coronary atherosclerosis.

**Conclusion:** In patients with angina, aortic distensibility is related to the severity of coronary atherosclerosis. Larger elastic artery (aortic) stiffening can be considered as a marker of the severity of coronary atherosclerosis, providing non-invasive information.

#### 21.

##### THE ASSOCIATION OF BETWEEN CORONARY SPASM AND B-TYPE NATRIURETIC PEPTIDE AND PULSE WAVE VELOCITY

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**Background:** Coronary spasm cause transient LV dysfunction and consequently may increase BNP by chance. However, the correlation between coronary spasm and BNP has not been verified. We investigated the association between coronary spasm and BNP and pulse wave velocity (PWV) in patients with preserved LV function.

**Methods:** A patients with chest pain who have ejection fraction  $>50\%$  underwent both diagnostic coronary angiography with acetylcholine provocation and NT-proBNP measurement simultaneously were enrolled for the study. PWV were done in all patients. Significant coronary artery spasm was defined as focal ( $>70\%$ ) or diffuse severe transient luminal narrowing ( $>90\%$ ) with/without chest pain or ST-T change of ECG.

**Results:** Among total 1,342 patients, 793 patients with heart failure, arrhythmia, CAD or VHD were excluded and 549 patients were enrolled. Thirty five percent (192/549) of enrolled subjects showed positive result at acetylcholine provocation test. Baseline characteristics were well balanced between the spasm group and control group. In the univariate analysis, the BNP levels of spasm group were lower than control group ( $146 \pm 363$  pg/mL vs.  $197 \pm 532$  pg/mL,  $P = 0.050$ ). But in the multivariate analysis, there was no significant difference of BNP between two groups. Also there is no difference of PWV value between the groups.

**Conclusion:** There is no significant relationship between BNP, PWV and vasospastic angina. These finding suggest that vasospastic angina with normal left ventricular systolic function is not associated with BNP or PWV.

#### 22.

##### BP VARIABILITY AS WELL AS MEAN BP FROM AMBULATORY BLOOD PRESSURE AND HOME BLOOD PRESSURE CORRELATES WELL WITH TARGET ORGAN DAMAGE IN UNTREATED HYPERTENSIVE PATIENTS

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**Background:** We sought to assess the relation of ambulatory blood pressure (ABP) measurement and home blood pressure (HBP) measurement with target organ damage using BP variability (BPV) as well as mean BP in untreated hypertensive patients.

**Methods:** Seventy-nine untreated patients with hypertension (men : 52 and female : 27, mean age,  $47.5 \pm 13.1$  years) underwent measurements of ABP, HBP and OBP. The ABP was recorded for 24hrs, HBP was measured for 1week, and OBP was measured at least in two visits. All BP measurements were taken using automatic BP measuring device. The parameters indicating target organ damage were the left-ventricular mass index (LVMI) by transthoracic echocardiography, urinary albumin excretion rate (AER), carotid-femoral pulse-wave velocity (PWV), and carotid intima-media thickness (IMT).

**Results:** The LVMI was significantly correlated with systolic HBP, systolic/diastolic 24hrs ABP, and systolic ABP variability (ABPV), but was not correlated with OBP. The AER, PWV and IMT were significantly correlated with systolic HBP. In a binary logistic regression analysis, systolic HBP was only predictor of LVMI ( $p = 0.003$ ) and systolic HBP, systolic 24hrs ABP and systolic HBPV were significant predictors of PWV (HBP;  $p = 0.001$ , ABP;  $p = 0.027$ , HBPV;  $p = 0.036$ ). Also, systolic HBP was independent predictor of AER and PWV by multiple regression analysis (AER;  $p = 0.004$ , PWV;  $p = 0.009$ ).

**Conclusion:** Our data suggest that ABP and HBP measurements are closely related to hypertension-induced target organ damage as assessed by LVMI, AER and PWV. Therefore, ABP and HBP measurements using BP variability as well as mean BP may give additive information for the prediction of cardiovascular target organ damage in hypertension.