Meeting abstract

1005 Risk factors associated with increased coronary artery wall thickness by MRI: the multi-ethnic study of atherosclerosis (MESA)

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Introduction
Coronary artery wall MRI has been shown to demonstrate increased thickness of the coronary wall in patients with clinically documented coronary artery disease.

Purpose
The purpose of this study was to evaluate the relationship between coronary artery disease risk factors as well as imaging markers for atherosclerosis versus coronary artery wall thickness measured by MRI in asymptomatic individuals without known coronary artery disease.

Methods
One hundred twenty three (123) asymptomatic subjects (57 males, mean age 62 +/- 9 yrs, 76 white, 46 blacks) in the Multi-Ethnic Study of Atherosclerosis (MESA) study were enrolled and underwent coronary wall MRI of the left and right coronary arteries at 5 mm intervals using a black blood turbo spin echo technique. All subjects had blood serum testing, blood pressure measurements, and anthropomorphic measurements. Carotid intimal-medial thickness and cardiac CT for calcium measurement were performed according to standard protocols.

Results
In unadjusted models, male gender, diabetes, dyslipidemia, nonzero calcium score and common carotid intimal-medial thickness were associated with greater mean coronary artery wall thickness ($p < 0.05$) (Table 1). In multi-variable models of traditional risk factors (Model 1), male gender ($p = 0.02$) remained significant and diabetes history showed a trend towards significance ($p = 0.08$); coronary calcium score (zero vs. nonzero) or category of calcium score showed no significant relationship (model not shown). With the addition of common carotid IMT to Model 1, greater carotid IMT showed a strong relationship to coronary artery wall thickness (0.43 mm MRI/mm carotid IMT (0.11, 0.75), $p = 0.009$) that was nearly unchanged with the addition of calcium score status (0.43 (0.11, 0.75), $p = 0.008$) (Table 1, Model 2).

Conclusion
In asymptomatic individuals free of clinical cardiovascular disease, greater coronary artery wall thickness by MRI was associated with gender, diabetes and dyslipidemia as well as computed tomography and ultrasound measures of atherosclerotic disease burden; overall coronary wall thickness was strongly related to common carotid IMT in multi-variable models.

Table 1: In individuals free of clinical cardiovascular disease, coronary wall thickness by MRI was associated with gender, diabetes and dyslipidemia and computed tomography and ultrasound detected atherosclerotic disease; coronary wall thickness was strongly related to common carotid IMT in multi-variable models.

Risk factor	Univariable Model		Multi-variable Model 1		Multi-variable Model 2	
	regression coefficient	p-value	regression coefficient	p-value	regression coefficient	p-value
Age (years)	0.0035 (-0.0021, 0.009)	0.22	0.0029 (-0.0028, 0.0087)	0.31	-0.0008 (-0.007, 0.0054)	0.8
Gender (ref, female)	0.14 (0.047, 0.24)	0.004	0.11 (0.017, 0.21)	0.02	0.070 (-0.028, 0.17)	0.16
Hypertension	0.042 (-0.056, 0.14)	0.4	-0.011 (-0.12, 0.095)	0.84	-0.036 (-0.14, 0.070)	0.5
Smoking history	0.032 (-0.065, 0.13)	0.51	0.028 (-0.069, 0.12)	0.57	0.03 (-0.065, 0.12)	0.53
Diabetes	0.19 (0.036, 0.3432)	0.02	0.14 (-0.015, 0.30)	0.08	0.097 (-0.059, 0.25)	0.22
Dyslipidemia	0.091 (-0.0045, 0.19)	0.06	0.054 (-0.048, 0.16)	0.29	0.061 (-0.040, 0.16)	0.24
CAC score > 0 (0 CAC = reference)	0.12 (0.023, 0.2123)	0.02			0.053 (-0.053, 016)	0.32
Carotid IMT (mm)	0.49 (0.21, 0.77)	0.0007			0.43 (0.11, 0.75)	0.009