



ACC.15

TCT@ACC-12 | innovation in intervention

A1503
JACC March 17, 2015
Volume 65, Issue 10S

Prevention

ETHNICITY, CORONARY ARTERY CALCIUM SCORE AND CARDIOVASCULAR RISK RECLASSIFICATION

Poster Contributions

Poster Hall B1

Monday, March 16, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Risk Assessment, Exercise and Atrial Fibrillation

Abstract Category: 21. Prevention: Clinical

Presentation Number: 1246-107

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Background: Recent guidelines propose the use of the Atherosclerotic Cardiovascular Disease score (ASCVD) to assess an individual's risk of future cardiovascular disease (CVD) events. However, few data exist on evaluating predictive utility of the coronary artery calcium score (CACS) as an adjunct to ASCVD score across various ethnicities.

Methods: Multi-Ethnic Study of Atherosclerosis (MESA) is a population based study (n=6,814) of White (38%), Black (28%), Chinese (22%) and Hispanic (12%) subjects, aged 45-84 years, free from clinical cardiovascular disease. We performed an analysis of 6,742 participants (mean age 62, 53% female) from the MESA cohort. The ASCVD score was calculated for each participant in accord with the American College of Cardiology/ American Heart Association guidelines using pooled cohort equations. Analytic properties of models incorporating the ASCVD score with and without CACS were compared for CVD prediction.

Results: See Table 1

Conclusion: ASCVD score performs well across the ethnicity strata. Non-significant improvement in reclassification properties with addition of CACS to ASCVD score is likely explained by the limitations of sample size, event rate and follow-up duration.

Table 1: Analytic Properties of ASCVD Risk Score* With and Without Coronary Artery Calcium Score across Ethnicity for prediction of cardiovascular disease events©

	Caucasian American	Chinese American	African American	Hispanic American
Number of Patients/ Event	2599/ 140	801/ 20	1850/ 92	1492/ 74
Event Rate [per 1000 person-years]	5.4%	2.5%	5.0%	5.0%
Discrimination				
C Statistic for ASCVD score	0.734	0.734	0.707	0.800
C Statistic for ASCVD score + CACS	0.753	0.747	0.740	0.809
Improvement in C Statistic (p value)	0.019 (p=0.18)	0.013 (p=0.66)	0.033 (p=0.11)	0.009 (p=0.45)
Calibration				
Hosmer-Lemeshow Chi-square (p value)	11.9 (p=0.16)	4.9 (p=0.77)	11.0 (p=0.20)	12.3 (p=0.14)
Bayes Information Criterion support for model with CACS	Very strong	Positive	Very strong	Very strong
Reclassification				
[†] Categorical NRI (p value)	0.111 (p=0.02)	-0.121 (p=0.11)	0.111 (p=0.082)	0.024 (p=0.61)
Category-less NRI (p value)	0.587 (p<0.001)	0.701 (p=0.003)	0.500 (p<0.001)	0.472 (p<0.001)
Integrated Discrimination Index (p value)	0.012 (p<0.001)	0.005 (p=0.27)	0.014 (p<0.001)	0.006 (p=0.23)

Abbreviations: ASCVD = Atherosclerotic cardiovascular disease, CACS = Coronary artery calcium score; NRI = Net reclassification index
*ASCVD risk score was calculated in compliance with pooled cohort equation provided by American College of Cardiology/ American Heart Association guidelines which incorporated gender and ethnicity based risk estimated incorporating following risk factors: age, total cholesterol, high density lipoprotein cholesterol, systolic blood pressure, treatment for hypertension, diabetes, current smoking. For Chinese and Hispanic Americans, risk estimates of Caucasian Americans were assigned as suggested by the guidelines.

©CVD events included myocardial infarction, death due to myocardial infarction, resuscitated cardiac arrest, stroke, and death from stroke.

The *interaction* between ethnicity and ASCVD for prediction of CVD events was not statistically significant (p=0.30)

[†]In calculation of categorical NRI, risk categories for ASCVD score were re-calibrated to provide corresponding risk estimates for 7 years follow-up.