A Previously Validated Peripheral Gene Expression Score is Mostly Determined by Non-Calcified Plaque and Luminal Stenosis as Assessed by Quantitative, 3-Dimensional Measurements by CT Angiography in the Multi-Center, Prospective COMPASS Study

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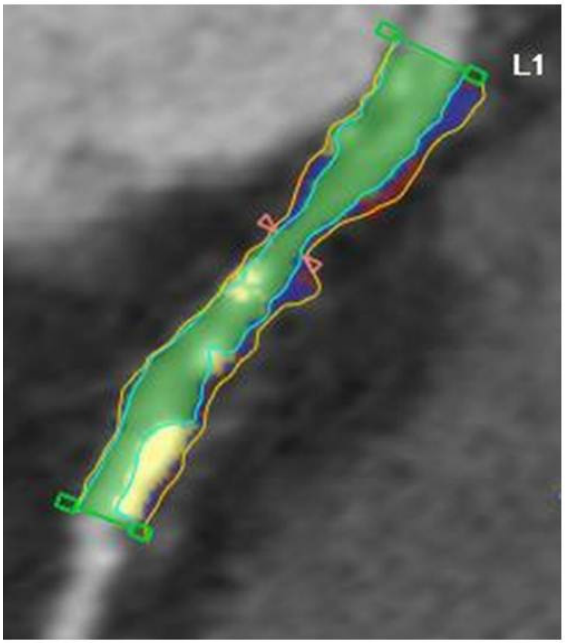
Abstract:
Background: We previously validated a 23-gene PCR-based gene expression score (GES) for detection of obstructive coronary artery disease (CAD) (>50% by quantitative coronary angiography). Whether GES is associated with 3-dimensional, quantitative measurements on CTA, using a method we previously validated and published against radiofrequency backscatter intravascular ultrasound (IVUS/VH), is unknown.

Methods: In the prospective, multi-center COMPASS study, 327 patients (mean age 55; 51% male) had GES measurements (CorusCAD; CardioDX) and CTA, quantitatively analyzed by a core lab using previously validated and published methods. Percent diameter and area stenosis (%DS, %AS) and percent atheroma volume (PAV) in each segment, and volume of calcified plaque (CAP; >150 HU), high-density non-calcified plaque (HD-NCP; 30-150 HU) and low-density non-calcified plaque (LD-NCP; -100 to 30 HU) in segments >2 mm were measured. Linear regression was used to assess relationship between GES and plaque/stenosis.

Results: Obstructive CAD (%DS>50%) was seen in 39 pts (12%). %DS, %AS, PAV, CAP and NCP were significantly correlated to GES (Figure). In multivariable analysis including NCP and CAP, only NCP remained significant for GES.

Conclusions: In the low-risk population of COMPASS, increasing GES was associated with worse stenosis and more plaque; non-calcified plaque was the most important determinant of this largely inflammatory peripheral gene expression pattern.



Parameter	r-value	p-value
%DS	0.40	<0.001
%AS	0.40	<0.001
PAV	0.29	<0.001
CAP	0.24	<0.001
NCP	0.33	<0.001
LD-NCP	0.32	<0.001
HD-NCP	0.33	<0.001

Figure Legend. Quantitative CT-based stenosis and plaque measurements (left). Green: lumen; yellow: calcified plaque; blue: high-density non-calcified plaque; red: low-density non-calcified plaque. Correlation between CT-parameters and GES shown in the Table.

Reference:

Voros S, Thomas G, Lansky A, et al. A previously validated, peripheral blood gene expression score is mostly determined by non-calcified plaque and luminal stenosis as assessed by quantitative, 3-dimensional measurements by CT angiography in the multi-center, prospective COMPASS study. *J Am Coll Cardiol.* 2012;59:E1370.

Abstract Highlights:

- The COMPASS Trial is a prospective multi-center validation study designed to assess a blood-based gene expression test (Corus CAD) for the detection of obstructive CAD in non-diabetic symptomatic patients referred for MPI. (Results of the COMPASS study were presented at the AHA Scientific Sessions 2011 conference.)
- In this subset analysis, 327 patients in the COMPASS Trial received both CT Angiography and the gene expression score. There was a correlation between increasing gene expression score with increased % coronary stenosis and plaque volume.

- Non-calcified plaque was the most statistically significant determinant of the peripheral gene expression pattern or score.

Should you have any questions related to this study or abstract, please contact CardioDx Medical Affairs at medicalaffairs@cardiodx.com or 866-941-4996.