IMAGING AND DIAGNOSTIC TESTING

GLOBAL LONGITUDINAL STRAIN MEASURED FROM REST ECHOCARDIOGRAPHY IMAGES HAS COMPARABLE DIAGNOSTIC ACCURACY AS STRESS INDUCED WALL MOTION SCORE INDEX IN DETECTING SIGNIFICANT CORONARY ARTERY DISEASE

ACC Poster Contributions
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Background: Abnormalities of myocardial deformation have incremental prognostic value to wall motion abnormalities (WMA). We hypothesize that global longitudinal strain at rest detects myocardial adaptation to coronary artery disease (CAD), and is comparable to stress induced regional WMA.

Method: We evaluated 123 patients who had exercise or dobutamine stress echo, and angiography within 10 days. A 16 segment wall motion score index (WMSI) was determined based on the worst endocardial thickening at any stage of the stress test. A WMSI of >1 is abnormal. Speckle tracking was performed on 3 apical views of rest images and combined mean global strain (GS) determined. Significant CAD was defined as stenosis of >50%. The sensitivity/specificity of a WMSI>1 for detecting CAD was determined. The diagnostic power of GS for CAD was determined using ROC plots and the specificity of GS determined at a comparable sensitivity to WMSI. The diagnostic accuracies of the optimal cutpoints of GS and WMSI were compared using the McNemar test.

Result: Patient characteristics and ROC details are shown in Table. A WMSI of >1.0 has a sensitivity /specificity (S/S%) of 77/55 comparable to a 77/60 for GS of > -19.05%. The optimal cutpoint of -17.77% for GS with S/S% of 66/76, has a comparable overall accuracy as optimal WMSI of 1.13 (p=0.78 by McNemar test).

Conclusion: Resting global strain has comparable accuracy to stress induced WMSI for diagnosis of significant CAD. This has implications for patients unable to undergo stress test

Demographic and Echocardiographic Characteristics of Subjects By CAD Status

	CAD Present (n= 56)	No CAD (n=67)	p
Age (yrs)	62±11	58±12	0.0838
Male (%)	44	29	
Dobutamine (%)	17	14	
Exercise (%)	39	53	
Average LVEF (%)	58±10	62±10	0.0302
Echo Quality-Good (n, %)	25 (45)	34 (51)	NS
Echo Quality-Fair (n, %)	23 (41)	24 (36)	NS
Echo Quality-Poor (n, %)	8 (14)	9 (13)	NS
Rest Wall Motion Score Index	1.07± 0.13	1.02±0.07	0.0072
Maximal Wall Motion Score Index	1.32± 0.33	1.15±0.25	0.0012
Global Longitudinal Strain(%)	-16.80 ± 3.16	-19.03 ± 3.46	0.0003
Global Systolic Strain Rate)1/sec)	-0.84 ± 0.17	-0.98 ± 0.18	<0.0001
Global Early Diastolic strain Rate	0.84± 0.32	0.99± 0.32	0.0114
Test Performance - ROC Curve			
Prevalence	Area Under curve	95% CI	p
Maximal Wall Motion Score Index	0.69	0.60 to 0.78	<0.0001
Global Longitudinal Strain %	0.72	0.63 to 0.82	<0.0001
Global Systolic Strain Rate (1/sec)	0.73	0.64 to 0.82	<0.0001
Global diastolic strain Rate (1/sec)	0.64	0.54 to 0.74	0.0026