Myocardial perfusion imaging performance in the PREDICT multi-center trial; gender specific analysis and comparison with the Corus CAD gene expression score

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Abstract:
Background: Diagnosis of obstructive coronary artery disease (CAD) in stable chest pain patients includes non-invasive testing and the gold standard of coronary angiography. An RT-PCR based 23 gene expression test, Corus CAD, has been developed and validated for the assessment of obstructive CAD in the PREDICT multi-center trial in which all patients were referred to invasive coronary angiography. An analysis of gender specific performance of myocardial perfusion imaging (MPI) with Corus CAD in the PREDICT trial has not previously been reported.

Methods: MPIs were performed during the clinical workup for the angiographic population in the PREDICT multi-center clinical validation study. MPIs were defined as positive if at least one reversible or fixed defect consistent with obstructive CAD was observed; indeterminate or intermediate defects were considered negative. Obstructive CAD was defined as 1 or more lesions with ≥50% stenosis by quantitative coronary angiography (QCA).

Results: In the PREDICT validation cohort (N=526, 57% men, 37% obstructive CAD) 310 patients had MPIs of which 223 were positive. In men, 41% of the positive MPIs (58/142) had obstructive CAD by QCA, but only 23% (18/81) of women. The discordance between MPI and QCA may be partially due to

clinically-driven referral bias. Overall, the sensitivity and specificity of MPI were 78 and 31%, respectively, whereas for Corus CAD they were 87% and 40%. The Corus CAD score improved MPI based classification of obstructive disease patients by either reclassification or ROC analyses ($p=2x10^{-8}$ and $2x10^{-6}$, respectively). For female MPI positive patients, 56% were reclassified correctly as low risk of obstructive CAD by the Corus CAD score; of 51 low Corus CAD and positive MPI women 88% (45/51) did not have obstructive CAD.

Conclusions: In the PREDICT study, positive MPI results were not significantly predictive of obstructive CAD, with decreased performance in women. The Corus CAD gene expression score added diagnostic value, improved MPI performance overall, and may be particularly useful in identifying false positive MPIs in women. Further studies in a non-angiography referred population will help determine the generality of these results.