A Gender-Specific Blood-Based Gene Expression Score for Assessing Obstructive Coronary Artery Disease in Nondiabetic Patients: Results of the Personalized Risk Evaluation and Diagnosis in the Coronary Tree (PREDICT) Trial

Meeting: Women's Health 2013: The 21st Annual Congress

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Background: Currently available noninvasive tests to risk stratify patients for obstructive coronary disease result in many unnecessary cardiac catheterizations, especially in women.

Objective(s): We sought to compare the diagnostic accuracy of presenting symptoms, noninvasive test results, and a gene expression score (GES) in identifying obstructive coronary artery disease (CAD) according to gender, using quantitative coronary angiography as the criterion standard.

Materials/Methods: The PREDICT trial is a prospective multicenter observational study designed to develop and validate gene expression algorithms to assess obstructive CAD, defined as at least one ≥50% diameter stenosis measured by quantitative coronary angiography. Patients referred for diagnostic cardiac catheterization with suspected but previously unknown CAD were enrolled. Noninvasive myocardial perfusion imaging (MPI) was available in 60% of patients. The GES, comprising gender-specific age functions and 6 gene expression terms containing 23 genes, was performed for all patients.

Results: A total of 1,160 consecutive patients (57.6% men and 42.4% women) were enrolled in PREDICT. The prevalence of obstructive CAD was 46.7% in men and 22.0% in women. Chest pain symptoms were a discriminator of obstructive CAD in men (P b .001) but not in women. The positive predictive value of MPI was significantly higher in men (45%) than in women (22%). An abnormal site-read MPI was not significantly associated with obstructive or severity of CAD. The GES was significantly associated with a 2-fold increase in the odds of obstructive CAD for every 10-point increment in the GES and had a significant association with all measures of severity and burden of CAD. By multivariable analysis, GES was an independent predictor of obstructive CAD in the overall population (odds ratio [OR] 2.53, P = .001) and in the male (OR 1.99, P = .001) and female (OR 3.45, P = .001) subgroups separately, whereas MPI was not.

Conclusions: Commonly used diagnostic approaches including symptom evaluation and MPI performed less well in women than in men for identifying significant CAD. In contrast, gender-specific GES performed similarly in women and men. Gene expression score offers a reliable diagnostic approach for the assessment of nondiabetic patients and, in particular, women with suspected obstructive CAD. (Am Heart J 2012;164:320-6.)

Reference: Lansky A, Elashoff MR, Ng V, et al. A Gender-Specific Blood-Based Gene Expression Score for Assessing Obstructive Coronary Artery Disease in Nondiabetic Patients: Results of the Personalized Risk Evaluation and Diagnosis in the Coronary Tree (PREDICT) Trial. *J of Womens Health*. 2013;22:P17.