The Use of a Personalized Gene Expression Test to Improve Decision Making in the Evaluation of Women with Suspected Coronary Artery Disease

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Background: More accurate coronary artery disease (CAD) assessment methods are needed to reduce overuse of noninvasive diagnostic testing and associated risks of radiation and dye exposure, particularly in women.

Objective(s): We hypothesized that gene expression score (GES) results would improve the diagnostic evaluation of women by reduction of referrals to the cardiologist.

Materials/Methods: The GES is a validated quantitative diagnostic test for non-diabetic patients, measuring expression levels of 23 genes from peripheral blood cells to determine the likelihood of a patient having at least one vessel with ≥50% coronary artery stenosis. As previously reported in a large study of patients referred for non-invasive testing, the GES has a negative predictive value of 96%. Four primary care practices underwent education and training in the use and interpretation of the GES. A total of 141 female patients presented to these practices with chest pain and underwent GES testing from January to September 2011. In this gender-based post-hoc analysis, we extracted medical chart information on patient demographics, chest pain symptoms, diagnostic testing, GES, and cardiology referrals.

Results: Patients had a median age of 58 years and presented with typical and atypical symptoms (n = 78, 55%), with ≥3 risk factors for CAD (n = 49, 35%), or with < 3 risk factors for CAD (n = 14, 10%). There were 103 (73%) patients with low GES (≤15, 1–40 scale). The primary analysis was the proportion of referrals to a cardiologist among low and elevated GES patients. Overall, 30 (21%) patients were referred to a cardiologist: 12% (n = 12) of low and 48% (n = 18) of elevated GES patients. The odds ratio by logistic regression for referral for low GES patients was 0.23 (p = 0.029), controlling for age, type of symptoms, and practice site. There were no major adverse cardiac events among the 67% (n = 95) of patients available for follow-up with an average duration of 163 days.

Conclusions: Patients with low GES were 77% less likely to be referred to a cardiologist. This clinical practice innovation involving personalized gene expression scores may be used by primary care physicians to rule out women patients at low-risk for obstructive CAD.

Reference: Conlin M, Herman L, Mouton M, et al. The Use of a Personalized Gene Expression Test to Improve Decision Making in the Evaluation of Women with Suspected Coronary Artery Disease. *J of Womens Health.* 2013;22:P16.