Improved Diagnostic Work-up of Patients Presenting to the Cardiologist with Symptoms of Suspected Obstructive Coronary Artery Disease: Results from the IMPACT (Investigation of a Molecular Personalized Coronary Gene Expression Test on Cardiology Practice Pattern) Trial

Meeting:
Quality of Care and Outcomes Research (QCOR) 2012 Scientific Session

Authors:
John A. McPherson MD, Kelly Davis MD, May Yau MS, Phil Beineke PhD, Steven Rosenberg PhD, Mark Monane MD, Joseph L. Fredi MD

Abstract:
Introduction: In a recently-published registry of over 14,000 patients (pts), the pretest probability of coronary artery disease (CAD) in pts referred for advanced cardiovascular imaging based on clinical factors overestimated the actual presence of disease. Better methods are needed to more accurately assess the CAD risk of pts in an office–based, non-invasive fashion.

Hypothesis: We hypothesized that gene expression score (GES) results would lead to a change in the cardiologist's diagnostic evaluation of stable pts presenting in the ambulatory setting with symptoms suggestive of obstructive CAD.

Methods: The IMPACT Trial was a single center, prospective study which enrolled 88 consecutive pts with no history of CAD who were referred to five cardiologists for evaluation of chest pain and related symptoms. The cardiologist's diagnostic strategy was evaluated before and after the GES was known (prospective arm) and was compared to the retrospective cohort. The retrospective control cohort was derived from pts matched by clinical factors to the prospective cohort. The GES is a validated quantitative blood-based diagnostic test for nondiabetic pts, 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. The primary outcome of interest was the change in the diagnostic testing pre/post GES as measured by McNemar's test and logistic regression modeling.

Results: Characteristics of the 83 pts eligible for primary endpoint analysis included 57 (69%) women, mean age of 53.3 years (SD±11), average BMI of 29.5 (SD±6), and mean GES of 12.5(SD±9). Chest pain was evaluated as typical, atypical and non-cardiac in 33%, 60%, and 7% of pts (n=27, 50 and 6), respectively. Hypertension and dyslipidemia was present in 55% and 48% respectively. Following GES, a change in diagnostic testing (e.g. myocardial perfusion imaging, CTA and cardiac catheterization) was noted in 48 pts [58%, 95% CI (46%, 69%)]. More patients had a decreased versus increased level of testing (n=32 (39%) vs n=16 (19%), p=0.03). In particular, 91% (29 of 32) of pts

with decreased testing had low GES (≤ 15), while 100% (16 of 16) of pts with increased testing had non-low GES ($p<0.001$). There were 13 pts referred to catheterization; 4/9 with non-low GES had lesions >70% stenosis and 0/4 with low GES had significant lesions. No major adverse cardiovascular events were observed for any patient at 30-day and at 6 months follow-up. The matched retrospective control cohort had higher rates of diagnostic test use compared with the post-GES evaluation of the prospective cohort ($p<0.001$).

Conclusion: In this study of diagnostic evaluation for CAD, the GES was associated with a clinically relevant and statistically significant change in the diagnostic test utilization, including both decreased and increased use of testing in low and non-low GES pts, respectively. In conclusion, the addition of the GES showed clinical utility by simplifying the physician's outpatient diagnostic strategy for suspected symptomatic CAD.

Reference:

McPherson JA, Davis K, Yau M, et al. Improved Diagnostic Work-up of Patients Presenting to the Cardiologist with Symptoms of Suspected Obstructive Coronary Artery Disease: Results from the IMPACT (Investigation of a Molecular Personalized Coronary Gene Expression Test on Cardiology Practice Pattern) Trial. *Circ Cardiovasc Qual Outcomes.* 2012;5:A115.

Abstract Highlights:

- The IMPACT Trial was a prospective, single-center study designed to assess the clinical utility of a gene expression score (GES) in stable, nondiabetic patients with symptoms suggestive of coronary artery disease.
- The primary endpoint was the change in cardiovascular diagnostic testing following use of the GES. A change in diagnostic testing was noted in 58% of patients.
- Of patients with a low GES (≤15), 91% had a decrease in testing. Among patients with increased testing, 100% had non-low (>15) GES scores.
- Results of this study show that GES was associated with a clinically relevant and statistically significant change in diagnostic test utilization.
- Addition of the GES demonstrated clinical utility by optimizing the diagnostic strategy for symptomatic patients with suspected CAD.

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