Abstract: P1753

Novel biomarker algorithmic panel measuring permutations of immune response to cardiac endothelial injury and global risk factors identifies patients at risk of acute coronary syndrome (ACS)

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Topic(s):
Acute Coronary Syndromes: Biomarkers

Citation:

Background: Global cardiovascular risk scores frequently underestimate risk in persons with underlying asymptomatic cardiac lesions who eventually experience cardiovascular events. The Get-With-The-Guidelines Initiative analysis revealed that over 70% of patients with a first cardiac event were well within guideline targets for lipid values. Most artery flow-disrupting events occur at locations with less than 50% lumen narrowing. From clinical studies published in the late 1990s using IVUS (in-the-artery-ultrasound) to visualize disease status, the typical heart attack occurs at locations with about 20% stenosis (narrowing), prior to sudden lumen closure and resulting ACS. This sudden lumen closure is caused by rupture of an unstable cardiac lesion causing a blood clot and occlusion in up to 75% of heart attacks. The role of multi-biomarker algorithms to identify vulnerable patients with these lesions at risk of short-term ACS events is of great interest.

Methods: We studied 725 adults (= 18 yrs) from Cardiology practices who received a 5-year modified Framingham Risk Score (mFRS), and a coronary artery disease predictive algorithm (CADPA) multi-biomarker score. CADPA incorporates 9 biomarkers (CTACK, Eotaxin, Fas Ligand, HGF, IL-16, MCP-3, sFas, HDL, and HbA1c) with age, sex, diabetes, and family history of myocardial infarction, previously shown to more accurately reclassify risk of cardiovascular events (cNRI=43%). Patients were classified into low (< 3.5%), intermediate (3.5% - < 7.5%), and high (= 7.5%) 5-year risk categories with both mFRS and CADPA. Patients low or intermediate risk by mFRS, but reclassified high by CADPA are reported and compared.

Results: Persons at low, intermediate, and high global risk categories were successively more likely to demonstrate high-risk scores with CADPA (Figure). However, 349 (65%) in the low mFRS risk group were reclassified into higher CADPA risk groups and 104 (70%) intermediate risk patients were reclassified into the high-risk group (p<0.0001 for CADPA vs. mFRS). Analysis demonstrated that 89% (309) of the low or intermediate mFRS [125 females (99%); 184 males (83%); p<0.0001] and, 86 below 65 years (93%) and 223 above 65 years (88% ; p=0.26)] were classified as high-risk by CADPA, indicating that many persons who may be at high risk are not identified as such by global risk assessment.

Conclusions: We conclude that this novel multi-biomarker panel (CADPA) identifies many persons at increased risk of cardiac events due to asymptomatic cardiac lesions missed by traditional global risk methods. Further investigation of the value of such a test for prediction of near-term CVD events is required.
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Figure. % of Persons in Each Global Risk Group Classified/Reclassified by the CADPA Risk Score (p<0.0001 for CADPA vs. mFRS risk distribution)