A New Integrated Clinical-Biohumoral Model to Predict Functionally Significant Coronary Artery Disease in Patients With Chronic Chest Pain.

Abstract:

In patients with chronic angina-like chest pain, the probability of coronary artery disease (CAD) is estimated by symptoms, age, and sex according to the Genders clinical model. We investigated the incremental value of circulating biomarkers over the Genders model to predict functionally significant CAD in patients with chronic chest pain. In 527 patients (60.4 years, standard deviation, 8.9 years; 61.3% male participants) enrolled in the European Evaluation of Integrated Cardiac Imaging (EVINCI) study, clinical and biohumoral data were collected. Functionally significant CAD, ie, obstructive coronary disease seen at invasive angiography causing myocardial ischemia at stress imaging or associated with reduced fractional flow reserve (FFR < 0.8), or both, was present in 15.2% of patients. High-density lipoprotein (HDL) cholesterol, aspartate aminotransferase (AST) levels, and
high-sensitivity C-reactive protein (hs-CRP) were the only independent predictors of disease among 31 biomarkers analyzed. The model integrating these biohumoral markers with clinical variables outperformed the Genders model by receiver operating characteristic curve (ROC) (area under the curve [AUC], 0.70 [standard error (SE), 0.03] vs 0.58 [SE, 0.03], respectively, P < 0.001) and reclassification analysis (net reclassification improvement, 0.15 [SE, 0.07]; P = 0.04). Cross-validation of the ROC analysis confirmed the discrimination ability of the new model (AUC, 0.66). As many as 56% of patients who were assigned to a higher pretest probability by the Genders model were correctly reassigned to a low probability class (< 15%) by the new integrated model. The Genders model has a low accuracy for predicting functionally significant CAD. A new model integrating HDL cholesterol, AST, and hs-CRP levels with common clinical variables has a higher predictive accuracy for functionally significant CAD and allows the reclassification of patients from an intermediate/high to a low pretest likelihood of CAD.