Abstract

BACKGROUND:

The relationship between the extent and severity of stress-induced ischemia and the extent and severity of anatomic coronary artery disease (CAD) in patients with obstructive CAD is multifactorial and includes the intensity of stress achieved, type of testing used, presence and extent of prior infarction, collateral blood flow, plaque characteristics, microvascular disease, coronary vasomotor tone, and genetic factors. Among chronic coronary disease participants with site-determined moderate or severe ischemia, we investigated associations between ischemia severity on stress testing and the extent of CAD on coronary computed tomography angiography.

METHODS:

Clinically indicated stress testing included nuclear imaging, echocardiography, cardiac magnetic resonance imaging, or nonimaging exercise tolerance test. Among those with preserved renal function who underwent coronary computed tomography angiography, we examined relationships between ischemia and CAD by coronary computed tomography angiography, overall, and by stress test modality, regardless of subsequent randomization. Core laboratories categorized ischemia as severe, moderate, mild, or none, while the extent and severity of anatomic CAD were categorized based on the modified Duke prognostic index.

RESULTS:

Among 3601 participants with interpretable stress tests and coronary computed tomography angiography, ischemia severity was weakly associated with CAD extent/severity (r=0.27), with modest variability in strength of association by modality: nuclear (n=1532; r=0.40), echocardiography (n=827; r=0.15), cardiac magnetic resonance imaging (n=108; r=0.31), and exercise tolerance test (n=1134; r=0.18). The extent of infarction on nuclear imaging and echocardiography was weakly associated with CAD extent/severity.

CONCLUSIONS:

Overall, ischemia severity on stress testing showed weak to moderate associations with the anatomic extent of CAD in this cohort with moderate or severe ischemia on local interpretation and controlled symptoms.

REGISTRATION:

URL: https://www.clinicaltrials.gov; Unique identifier: NCT01471522.

Graphical Abstract

