

39. Microvascular Dysfunction Based on Angiography-Derived Index Is Associated With Increased Risk of Heart Failure Related Outcomes in Patients With Non-Obstructive Coronary Artery Disease

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Body

Introduction: Coronary angiography-derived index of microvascular resistance (caIMR) is a vessel-based index for coronary microvascular dysfunction assessment, which was suggested to be a less invasive alternative to wire-based index of microvascular resistance (IMR). In patients with non-obstructive coronary artery disease (NOCAD), the role of microvascular dysfunction is not fully known. In this study, we aimed to evaluate the association between caIMR-based microvascular dysfunction and heart failure related outcomes (HFRO) in NOCAD patients.

Methods: Patients with stable coronary artery disease and without $\geq 50\%$ diameter stenosis in any of the coronary arteries on coronary angiography were included. For every patient, the average-caIMR value was calculated from caIMR values measured in the three major coronary arteries. Based on the threshold adopted from IMR studies, patients were stratified into high-average-caIMR group (average-caIMR ≥ 25 U) and low-average-caIMR group (average-caIMR < 25 U). The primary endpoint was HFRO, defined as a composite of heart failure related hospitalization and new or increased requirement of diuretics.

Results: Among 325 patients included (mean age 63.4 ± 11.0 , male 57.2%; mean average-caIMR of 22.9 ± 8.1 U), 105 patients (32.3%) were stratified into the high-average-caIMR group and 220 patients (67.7%) were stratified into the low-average-caIMR group. The rate of HFRO at 5 years was higher in the high-average-caIMR group compared to low-average-caIMR group (22.9% vs. 10.9%; $P=0.005$). In multivariable analysis adjusted for age, Charlson Comorbidity Index and baseline heart failure, high-average-caIMR was associated with an increased risk of HFRO at 5 years (sub-distribution hazard ratio [sHR], 2.45; 95% confidence interval [CI], 1.38-4.35; $P=0.002$). With the same multivariable adjustment, per 1U increase in average-caIMR was also associated with an increased risk of HFRO at 5 years (sHR, 1.07; 95% CI, 1.05-1.09; $P<0.001$).

Conclusion: Based on assessment by caIMR, microvascular dysfunction is associated with a higher risk of HFRO at 5 years in patients with NOCAD.

Clinical Implications: My study will help enable cardiovascular clinicians to know the potential clinical and research values of a novel non-invasive tool that assesses coronary microvascular dysfunction.