



EDITORIAL COMMENT

Can we predict obstructive coronary artery disease in patients with heart failure with reduced ejection fraction?



Podemos prever a presença de doença arterial coronária em doentes com insuficiência cardíaca e fração de ejeção reduzida?

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Available online 8 October 2022

Obstructive coronary artery disease (CAD) is responsible for 43.1% of cases of chronic heart failure (HF).¹ The 2021 European Society of Cardiology guidelines for the diagnosis and treatment of acute and chronic heart failure² recommend performing coronary angiography in patients with angina despite pharmacological therapy or with symptomatic ventricular arrhythmias (class I recommendation, level of evidence B), and it may be considered in patients with heart failure with reduced ejection fraction (HFrEF) with an intermediate to high pre-test probability of CAD and the presence of ischemia in non-invasive stress tests (class IIb, level B).

Nevertheless, only 58% of patients with left ventricular dysfunction undergoing coronary angiography present significant obstructive CAD.³ Moreover, new clinical tools that better predict CAD in HF patients in daily practice and that help in selecting which patients should undergo cardiac catheterization are recognized as an unmet need.

The study by Albuquerque et al. published in this issue of the *Journal*⁴ presents a retrospective analysis of 452 patients with new-onset HFrEF of unknown etiology who underwent coronary angiography in a single tertiary cen-

ter. Six independent predictors for significant CAD were identified – male gender, diabetes, dyslipidemia, smoking, peripheral artery disease and the presence of segmental wall motion abnormalities on two-dimensional echocardiography – and a multivariate model of CAD was used to generate a predictive score. These variables are similar to those identified by other authors.³ According to the score, patients were categorized into three groups: low-risk (score ≤ 3 points; predicted probability 1.21–13.0%), intermediate-risk (4–5 points; predicted probability 34.5–55.4%), and high-risk (≥ 6 points; predicted probability: 75.0–100.0%). Patients with a score ≤ 3 presented CAD in less than <15% of cases and the score presented good discriminative power and calibration.

It is important to underline that, after patients with previously known CAD (including those with previous myocardial infarction or myocardial revascularization) or positive stress test were excluded, the prevalence of CAD was lower than reported in other studies. Only 24.1% of the patients presented CAD and more than half of these had only single-vessel disease, which suggests that the majority of these patients did not have ischemic HF. The benefit and prognostic impact of myocardial revascularization in these patients is therefore questionable.

At the same time, in recent years new alternative diagnostic imaging modalities have been introduced in clinical practice. In patients with a low score, coronary computed

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<https://doi.org/10.1016/j.repc.2022.10.002>

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tomography angiography could be considered as an alternative approach and serve as a gatekeeper to invasive coronary angiography in patients with low to intermediate likelihood for CAD who present with new-onset HF.⁵

In patients with preserved or mildly reduced ejection fraction, the prevalence of CAD is equally high, and is responsible for 60.7% and 52.4% of cases of HF.⁶ It would be useful to determine how this score behaves in these populations in daily practice and if it could be used in the future.

The study cohort was identified at a single center with its own practice standards. External validation of this model might be useful in order to assure wider clinical applicability.

In conclusion, this study presents a practical score that can be calculated using easily accessible variables and that enables clinicians to identify patients who should undergo coronary angiography and those in which it is unnecessary and should be deferred, leading to a reduction in the costs and unnecessary risks of this procedure.

Conflicts of interest

The author has no conflicts of interest to declare.

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