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Out of sight, out of scores!

O que os olhos não veem, os escores não predizem!

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The attempt to identify patients who are more likely to present events, whether or not related to interventions, is a long search preceding the era of catheters.^{1,2} In 1977, for example, some of the most important predictors of adverse events related to coronary artery disease (CAD) were defined, such as the number of coronary vessels or territories involved, and the extent of myocardium at risk.³ The prognostic capacity of these variables was demonstrated to increase with the incorporation of other variables, like the degree of coronary obstruction. At the time, the Duke Jeopardy score was developed, and validated in 1985.⁴

The perception that combined variables could increase the capacity to predict major events, due to an additive effect, started to gradually gain momentum. The current clinical guidelines of the European Society of Cardiology (ESC),⁵ American College of Cardiology (ACC), and American Heart Association (AHA)⁶ recommend the use of the Global Registry of Acute Coronary Events (GRACE) or the Thrombolysis in Myocardial Infarction (TIMI) risk scores for stratification of individual patients, and the GRACE is validated for all acute coronary syndromes (ACS) presentations, with or without ST segment elevation. Several studies have shown that the GRACE is better in discriminating individuals at greater clinical risk,^{7,8} but neither of the two was intended and/or validated to predict CAD extent and severity before complete, invasive stratification using coronary angiography.

The SYNTAX score,⁹ with angiographic variables only, was developed to assess the population of patients with complex CAD, and is an important risk stratification tool, providing standardized assessment of atherosclerotic vessels, to determine the extent and severity of CAD. This score was validated in a study named after it, which also confirmed that the higher the angiographic complexity of CAD, the poorer the prognosis of patients undergoing percutaneous management, which does not seem to markedly affect patients referred for coronary artery bypass graft. There are some studies validating the SYNTAX as an independent predictor of long-term mortality in patients with ACS.^{10,11}

However, the existence of a score with good discriminatory capacity, allowing for estimation of CAD severity before a coronary angiography is performed, could influence the decision to give antiplatelet agents (single vs. dual therapy) and the need for early (<24 hours) vs. late (within 72 hours) intervention, and thus enable better individualization of diagnosis and management.

Silvano et al., in an article published in the Journal of Transcatheter Interventions, investigated whether, using clinical variables alone, the GRACE was capable of predicting angiographic complexity in patients with ACS, when compared with the classical invasive assessment using the SYNTAX.¹² The study enrolled 183 patients, mostly males (61.7%), with a mean age of 65.7±10.4 years. The three ACS presentations were equally represented in the study, however there was a predominance of low clinical and angiographic risk, as per the GRACE (median score of 115, with an interquartile range – IQR 94–138) and SYNTAX (median score of 18.5; IQR 8–28.5) scores, respectively. The author concluded that the GRACE score is not a good predictor of anatomical complexity of coronary artery disease in ACS patients, and has weak correlation with the SYNTAX ($r=0.20$; area under the curve using the Receiver Operating Characteristic – ROC – curve of the GRACE score of 0.59). In the discussion, the authors highlight that Bekler et al.¹³ achieved similar results when assessing the capacity to predict CAD severity using the GRACE score in ACS patients (correlation coefficient $r=0.43$ and area

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under the ROC curve=0.65; 95%CI 0.56-0.74; $p=0.001$), with low accuracy from the diagnostic standpoint and, therefore, poor clinical relevance.

Although well conducted regarding statistics and clinically relevant, it is important to highlight that the present analysis comprises a relatively small population, primarily concentrated in the low-risk range, which restricts the authors' conclusions for other knowingly underrepresented ranges.

Nonetheless, the most relevant limitation of the study, even if not its primary objective, is that it failed to assess clinical outcomes which goes beyond clinical or angiographic complexity alone. In Brazil, we have an interesting study along these lines, recently published by Viana et al. According to the authors, when incorporated into the predictive model, the GRACE was able to increase the discriminatory capacity of the SYNTAX from 0.81 to 0.92 (95%CI 0.87-0.96; $p=0.04$),¹⁴ suggesting a risk stratification based on the clinical-anatomical paradigm rather than clinical or angiographic data alone.

Likewise, Garg et al. reported a modest, but significant difference between the Age, Creatinine and Ejection Fraction Score (ACEF), the SYNTAX and the SYNTAX logistical-clinical score (a combination of a modified ACEF score and the SYNTAX), in predicting 5-year mortality and major adverse cardiovascular events in patients with complex CAD and stable or unstable angina, or silent ischemia, referred for percutaneous coronary intervention.¹⁵

More recently, the SYNTAX II score was developed, combining clinical and angiographic variables, to better guide the choice between coronary artery bypass and percutaneous coronary intervention, for complex cases with advanced coronary involvement, having in view only one adverse event over time: the 4 year-mortality.¹⁶ Although it seems to be the best score for predicting survival of patients undergoing myocardial revascularization procedures, it reaffirms the central role of coronary anatomy in risk stratification and prognosis of CAD.

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