Commentary: Looking into the crystal ball: Will a clinical SYNTAX score help the heart team?

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For multiple reasons, coronary artery bypass grafting (CABG) has arguably become the most-studied surgical procedure. One of the motives for research on CABG is the existence of its competitor, percutaneous coronary intervention (PCI). Comparing the 2 myocardial revascularization strategies has been the subject of heated debate among cardiovascular experts over several decades. Subsequently, 2 notable developments originating from the landmark randomized Synergy Between PCI With Taxus and Cardiac Surgery (SYNTAX) trial—namely, the usage of an anatomical SYNTAX score (SS) and the formation of a heart team for optimal decision-making—have been adopted by clinicians globally. In this issue of The Journal, Barac and colleagues1 present real-world data on myocardial revascularization from an all-comer, prospective registry of Israeli patients with de novo multivessel coronary artery disease. The clinical SYNTAX score (CSS), readily calculated by multiplying the SS by the age, creatinine, and ejection fraction (ACEF) score, was demonstrated to be more accurate than the SS alone at stratifying 5-year mortality following CABG and PCI. The authors observed that, in combination with angiographic parameters, clinical parameters are necessary to tailor revascularization approaches. Indeed, the authors are to be commended for universally assessing patients with complex coronary disease in the setting of a heart team, which is now a staple of state-of-art practice.2 Although integrating clinical and angiographic parameters into a global risk score is not a novel concept, the current study raises important and relevant issues regarding the applicability of SYNTAX-based scoring systems in daily practice.

In any risk-scoring system, there is a necessary trade-off between accuracy and simplicity and ease of use. In their seminal article on the ACEF score, Ranucci and colleagues3 referred to the philosophical principle of parsimony, which states that the simplest explanation of a phenomenon is usually the preferred explanation. If a simple model can explain a phenomenon with the same level of precision as more complex models, the simpler model is preferred. Therefore, the key question that determines the relevance of the observations of Barac and colleagues for clinicians is whether the CSS is the “parsimonious” model when compared with SS and other related scoring systems.

Addressing this conundrum requires an understanding of the historical origins of constructing SYNTAX-based clinical tools. Since the publication of the SYNTAX trial, it has been recognized that each SS tertile contains subjects on opposite spectra of clinical risk.4 It has been hypothesized that a threshold of clinical risk exists, at which equipoise between CABG and PCI is reached in each tertile, and that certain patient subgroups benefit more from CABG than PCI. Thus, several SYNTAX-based clinical tools, such as the global risk classification approach, CSS, additive CSS, and logistic CSS, have been created by...
mixing and matching different clinical parameters with the SS to help clinicians navigate the complexity of the decision-making process.\(^5\)\(^6\) A recent meta-analysis of 6 randomized trials lends support to the notion that SS alone does not predict clinical outcomes after PCI and CABG, further attesting to the need to incorporate clinical parameters to optimize decision-making.\(^7\) An increasing body of evidence culminated in the creation of SYNTAX score II, which incorporates 8 interacting clinical and angiographic risk factors and has been validated to predict 4-year mortality after CABG and PCI in the SYNTAX cohort.\(^8\) A recent modification of this scoring system, known as SYNTAX score II 2020, incorporates 9 risk factors and has been validated to predict 10-year mortality and 5-year adverse events in the SYNTAX Extended Survival cohort.\(^9\) The strategic feature that distinguishes SYNTAX score II 2020 from its predecessor is that it predicts mortality risks for PCI and CABG individually, thus allowing the calculation of an absolute risk difference.\(^10\)

In fact, the saga of SYNTAX-based scoring systems is far from over. Although SYNTAX score II affords an unprecedented level of sophistication in risk stratification, the major impediment to its widespread adoption remains that scoring coronary lesions is a time-consuming process with significant inter- and intraobserver variability. We eagerly await the future in which automatic scoring is a tangible reality. Until then, it is unlikely that heart team discussions based on SS alone can be reliably replicated in a real-world setting. Even for patients from the registry used by Barac and colleagues, all scores were calculated post hoc at a core laboratory.

With this historical context in mind, we can confidently say that the improved prognostic accuracy afforded by incorporating the ACEF score is well worth the increase in complexity it adds to daily clinical practice. The ACEF score contains the 3 most essential pieces of information for predicting clinical outcome. In fact, Barac and colleagues’ observations realistically showed that the 4 parameters contained in the CSS are the pillars of informing long-term prognosis after revascularization.

As we endeavor to refine the abilities of SYNTAX-based scoring systems to predict patient outcomes, we must not forget to listen to our patients’ own concerns, preferences, and risk perceptions. Only by considering the patient as a whole, rather than as numbers and parameters, will the mist in the crystal ball lift to reveal the bright future that both percutaneous and surgical strategies can potentially create.

References