EDITORIAL COMMENT

Risk assessment in percutaneous coronary intervention and appropriate use criteria: Manual or automatic?☆

Avaliação do risco e uso apropriado da intervenção coronária percutânea. Portagem manual ou via verde eletrónica automática?

Rui Campante Teles [a,b]

[a] *Unidade de Intervenção Cardiovascular (UNICARV), Hospital de Santa Cruz, CHLO, Carnaxide, Portugal*
[b] *Centro de Estudos de Doenças Crónicas (CEDOC), Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Lisboa, Portugal*

Coronary artery disease is the leading cause of death in developed countries. Percutaneous coronary intervention (PCI) alleviates patients' symptoms and in many cases reduces mortality in settings of cardiac decompensation, particularly acute coronary syndromes (ACS).[1]

In the thirty years since PCI was introduced in Portugal, its indications have widened following improvement in techniques and results, and now include more complex and higher-risk situations. Advances have been seen in drug-eluting stents, adjuvant therapy, arterial access, imaging and understanding of the underlying physiology.[2]

The benefits of PCI must be weighed against the risk associated with intervention, which depends on clinical and angiographic variables. The ability to predict the outcome for a patient before and after PCI is extremely useful, in order to assess individual risk, to counsel patients and their families, and to plan revascularization strategies.[3–5] It also helps in identifying opportunities to improve quality and in comparing results between centers and operators.

The main requirements for cardiovascular risk scores are accessibility, ease and speed of use, ability to integrate with the institution's computer systems, and low cost. Risk scores must be validated, ideally for both short-term and long-term application (up to five years).

Most existing risk scores for PCI have significant limitations. The most widely used in interventional cardiology is the SYNTAX score, both the original and the updated clinical SYNTAX score, which are referred to in the European guidelines but can be complex and laborious to calculate, while the EuroSCORE II uses clinical variables and is easy to calculate. Both have been the subject of extensive external validation.[6–11] A variety of other interesting risk scores have been developed, but with limited applicability and external validation (especially in European populations), and with outcome restricted to in-hospital adverse events.[12]

The article by Timóteo et al. in this issue of the *Journal* is timely, specifically addressing these limitations and analyzing the role of risk scores derived from populations with ACS.[13] It concludes that the Global Registry of Acute Coronary Events (GRACE) score is to be preferred to the Mayo Clinic risk score (MCRS) and the National Cardiovascular Data Registry (NCDR) risk score for predicting in-hospital mortality in Portuguese patients undergoing PCI, mainly for ST-elevation myocardial infarction (STEMI).

The study population was large, reflecting the experience of a reference center between January 2005 and October 2013.

The proportion of STEMI was high (70.9%), which explains the demographic and clinical differences between this population and others, both Portuguese and non-Portuguese, used to derive risk scores, which had a lower prevalence of comorbidities that are generally associated with greater clinical complexity.[14–16]

This prospective observational registry was notable for the robustness of the statistical methods used to compare the different risk scores, which were calculated retrospectively.

The merit of the study lies in its comparison of the three scores in a Portuguese population, showing that they fulfill some of the main requirements of a risk score: they are freely accessible, easy to apply and free of charge. Ease of calculation was not evaluated, presumably because the GRACE score is available via computers and mobile devices, and although its calculation based on eight variables is manual, it is fast.[17] Calculation of the MCRS is also manual, but is more complex and therefore more time-consuming and less practical.[18] With regard to the NCDR score, presumably the simplified version 3, with eight variables, was used in the study; the simplified version 4 is now available, which uses 13 clinical variables, but only the full version includes significant angiographic predictors such as treated chronic total occlusions and stent thrombosis.[19]

The study focuses on in-hospital mortality, which was 4.5%. On the basis of the inclusion criteria, borderline cases, such as patients who did not undergo angiography or who had mild disease on angiography, were excluded, as were those who needed surgery or did not survive to be treated by PCI. Validation of the scores for events at 30 days and in the longer term would be valuable, since it is over this time-scale that there are the most gaps in our knowledge and the most interest for patients. From this standpoint, the inclusion of biomarkers could be particularly useful.[20,21]

In my opinion, the central question is the implementation and usefulness of risk assessment. First of all, risk scores should be available automatically at the patient's bedside, preferably via the institution's computer systems, in order to facilitate decisions regarding catheterization and treatment strategy. This is especially important given that, for long-term prognosis, the more complex and comprehensive scores are clearly more accurate and sensitive than simplified ones. Secondly, in this study in which two-thirds of the patients had STEMI and were revascularized, it would be of considerable interest to analyze what could have been done to reduce in-hospital mortality. The complications reported (stroke, major bleeding and mechanical complications) are of course associated with mortality, which leads to the question of the appropriate use of PCI, adjuvant therapy and arterial access according to the risk score.

In conclusion, the study by Timóteo et al. is original and significant, validating three risk scores for PCI in Portuguese patients with ACS. Physicians should be able to calculate risk automatically at the patient's bedside, but cannot as yet always do so. Prognostic risk assessment is included in most guidelines and is a valuable aid in counseling, planning, improving quality and assessing outcomes.

Conflicts of interest

The author has no conflicts of interest to declare.

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