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EDITORIAL COMMENT

Risk stratification in acute coronary syndromes – When perfect is the enemy of good☆

Estratificação de risco nas síndromes coronárias agudas – quando o ótimo é inimigo do bom

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Acute coronary syndrome (ACS) is a clinical entity that affects a heterogeneous group of patients, and thus risk stratification is essential for decisions on the treatment approach to adopt. The aggressiveness of the strategy should be proportional to the risk of cardiovascular events and take into account the risk of complications, particularly bleeding and renal dysfunction. Two factors make this stratification difficult. Firstly, the decision whether to adopt an invasive or a conservative strategy is taken before assessment of the coronary anatomy, but this is crucial to establishing the patient's risk level. Secondly, many variables – risk factors, clinical presentation, and demographic, electrocardiographic and laboratory data, among others – may affect prognosis. There have therefore been efforts in recent years to develop scoring systems that use multiple variables to provide an overall estimate of risk, not only for cardiovascular events (such as the Thrombolysis in Myocardial Infarction [TIMI][1] and Global Registry of Acute Coronary Events [GRACE][2] scores), but also for complications, like the Can Rapid risk stratification of Unstable angina patients Suppress ADverse outcomes with Early implementation of the ACC/AHA Guidelines (CRUSADE) Bleeding Score.[3]

It is against this background that the article by Timóteo et al.,[4] which aimed to perform an external validation of the ProACS risk score developed on the basis of ProACS, the Portuguese national ACS registry,[5] is published in this issue of the *Journal*.

The ProACS score enables early risk stratification; it is simple to calculate, since it includes only four dichotomized variables (age, systolic blood pressure, Killip class at admission and ST-segment elevation). It had previously been validated for in-hospital mortality, but in this study the authors compared its performance with the GRACE score, which has been widely validated and is recommended in the European Society of Cardiology (ESC) guidelines[6] and a score recently developed by a Canadian group, the Canada Acute Coronary Syndrome (C-ACS) risk score.[7] The authors showed that in their external validation cohort, composed of 3170 ACS patients from a single center, the ProACS score had reasonable discriminative ability, not only for in-hospital mortality (area under the receiver operating characteristic curve [AUC] 0.769) but also for 30-day (AUC 0.755) and one-year (AUC 0.748) mortality, similar to C-ACS, but lower than the GRACE risk score (AUCs of 0.857, 0.829 and 0.804 for

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in-hospital, 30-day and one-year mortality, respectively). Timóteo et al., as well as the group who originally developed the ProACS score, deserve recognition for their work, and the performance of the score should be evaluated in light of the small number of variables used (four) and the fact that they are weighted on a dichotomized basis, making it easy to calculate and thus more likely to be adopted in clinical practice. The complexity of a risk score with multiple variables and relative weightings can be inversely proportional to its ease of application, which may explain why many references to the TIMI score continue to be seen, even though its performance is clearly inferior to that of the GRACE score,[8] as has been shown by our group in a study cited in the latest ESC guidelines on ACS.[6]

The other advantage of the ProACS score is that it reflects efforts to develop and validate a risk stratification system based on the clinical characteristics of patients in the Portuguese national ACS registry, and may therefore identify genetic factors or aspects of management that are specific to Portugal.[5]

Finally, the usefulness and applicability of risk stratification scores may vary across the spectrum of ACS patients. While in non-ST-elevation ACS the considerable heterogeneity of patients and of therapeutic options, together with the recommendation for an immediate invasive strategy (<2 h) for very high risk patients in the latest ESC guidelines,[6] make risk stratification imperative, in patients with ST-elevation myocardial infarction (STEMI) this is less important for initial decision-making and choice of strategy, since in these patients the indication for percutaneous coronary intervention is almost universal and depends more on logistical considerations (such as availability of a catheterization laboratory) than on the level of clinical risk. In view of this difference, it is worth noting that the prevalence of STEMI in the external validation cohort was significantly higher than in the original development cohort from the ProACS registry (62.2% vs. 43.6%), which may have affected the AUCs reported in the study and may limit generalization of these findings to other centers, although the authors found no significant difference in the performance of the ProACS score in different clinical contexts (with or without ST elevation). Comparison between the ProACS and GRACE scores clearly reflects the dilemma of risk stratification in ACS, in which there is a delicate balance between complexity and performance, with complexity directly proportional to performance but inversely proportional to adoption in clinical practice – an example of when perfect is the enemy of good.

Conflicts of interest

The author has no conflicts of interest to declare.

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