Available bleeding scoring systems poorly predict major bleeding in the acute phase of pulmonary embolism

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Background: Bleeding prediction scores may help to guide acute management of patients with pulmonary embolism (PE). However, existing scoring systems have not been validated for in-hospital assessment. We aimed to compare 6 available bleeding scores, in a real-life cohort for the prediction of major in-hospital bleeding.

Methods: We recorded in-hospital characteristics of 2,754 PE patients included in a prospective observational multicenter cohort study contributing 18,028 person-days of follow-up. We assessed the VTE-BLEED, RIETE, ORBIT, HEMORRA2HAGES, ATRIA, and HAS-BLED scores at baseline. ISTH-defined bleeding events were independently adjudicated. The accuracy of the scores for the prediction of in-hospital bleeding was evaluated and compared.

Results: We observed 82 first in-hospital major bleeding events (3.0% (95% CI, 2.4–3.7)). Overall, the predictive power of bleeding scores was poor, with a C index ranging from 0.57 to 0.69 (Figure 1). The RIETE score had the numerically highest model fit and best discriminatory capacity, but without reaching statistical significance versus the ORBIT, HEMORR^{2}HAGES, and ATRIA scores. The VTE-BLEED and HAS-BLED scores had significantly lower C indices, integrated discrimination improvement, and net reclassification improvement compared to the four others.

Conclusion: Currently available scoring systems have insufficient accuracy for the prediction of in-hospital major bleeding in patients with acute PE. The development of acute-PE-specific risk scores is needed to optimally target patients that warrant bleeding-prevention strategies.

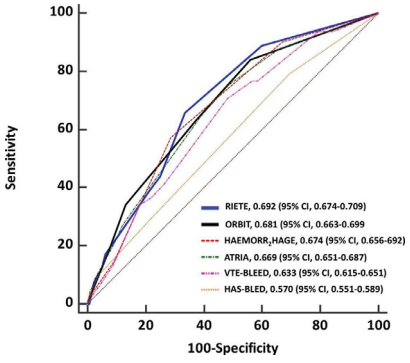

Figure 1