J Am Heart Assoc. 2015 Dec 7;4(12). pii: e002524. doi: 10.1161/JAHA.115.002524.

Incremental Value of the CRUSADE, ACUITY, and HAS-BLED Risk Scores for the Prediction of Hemorrhagic Events After Coronary Stent Implantation in Patients Undergoing Long or Short Duration of Dual Antiplatelet Therapy

Costa F, Tijssen JG , Ariotti S, Giatti S, Moscarella E, Guastaroba P, De Palma R, Andò G, Oreto G, Zijlstra F, Valgimigli M.

Abstract

BACKGROUND:

Multiple scores have been proposed to stratify bleeding risk, but their value to guide dual antiplatelet therapy duration has never been appraised. We compared the performance of the CRUSADE (Can Rapid Risk Stratification of Unstable Angina Patients Suppress Adverse Outcomes With Early Implementation of the ACC/AHA Guidelines), ACUITY (Acute Catheterization and Urgent Intervention Triage Strategy), and HAS-BLED (Hypertension, Abnormal Renal/Liver Function, Stroke, Bleeding History or Predisposition, Labile INR, Elderly, Drugs/Alcohol Concomitantly) scores in 1946 patients recruited in the Prolonging Dual Antiplatelet Treatment After Grading Stent-Induced Intimal Hyperplasia Study (PRODIGY) and assessed hemorrhagic and ischemic events in the 24- and 6-month dual antiplatelet therapy groups.

METHODS AND RESULTS:

Bleeding score performance was assessed with a Cox regression model and C statistics. Discriminative and reclassification power was assessed with net reclassification improvement and integrated discrimination improvement. The C statistic was similar between the CRUSADE score (area under the curve 0.71) and ACUITY (area under the curve 0.68), and higher than HAS-BLED (area under the curve 0.63). CRUSADE, but not ACUITY, improved reclassification (net reclassification index 0.39, P=0.005) and discrimination (integrated discrimination improvement index 0.0083, P=0.021) of major bleeding compared with HAS-BLED. Major bleeding and transfusions were higher in the 24- versus 6-month dual antiplatelet therapy groups in patients with a CRUSADE score >40 (hazard ratio for bleeding 2.69, P=0.035; hazard ratio for transfusions 4.65, P=0.009) but not in those with CRUSADE score ≤40 (hazard ratio for bleeding 1.50, P=0.25; hazard ratio for transfusions 1.37, P=0.44), with positive interaction (Pint=0.05 and Pint=0.01, respectively). The number of patients with high CRUSADE scores needed to treat for harm for major bleeding and transfusion were 17 and 15, respectively, with 24-month rather than 6-month dual antiplatelet therapy; corresponding figures in the overall population were 67 and 71, respectively.

CONCLUSIONS:

Our analysis suggests that the CRUSADE score predicts major bleeding similarly to ACUITY and better than HAS BLED in an all-comer population with percutaneous coronary intervention and potentially identifies patients at higher risk of hemorrhagic complications when treated with a long-term dual antiplatelet therapy regimen.