Individualizing Treatment Duration of Dual Antiplatelet Therapy After Percutaneous Coronary Intervention: An Analysis of the DAPT Study

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Background: Extended duration dual antiplatelet therapy (DAPT) after percutaneous coronary intervention (PCI) reduces stent thrombosis (ST) and myocardial infarction (MI) but increases bleeding. Strategies to individualize DAPT treatment duration are therefore needed to optimize patient outcomes.

Methods: The DAPT Study randomized 11,648 PCI patients who completed 12 months of DAPT to continued thienopyridine plus aspirin vs aspirin alone. Multivariable models to predict the composite of ST or MI (ischemia model) and GUSTO moderate/severe bleeding (bleeding model) were constructed using Cox regression. The predicted absolute reduction in ischemia and increase in bleeding assuming treatment with continued thienopyridine vs placebo was estimated for each patient, and the difference between these values was calculated (“benefit-risk difference”). The correlation between patient predicted ischemic and bleeding events was evaluated using Spearman’s Rho.

Results: Models to predict MI or ST and bleeding events beyond 12 months had moderate discrimination (c-stat 0.70 and 0.68, respectively). The predicted risks of ischemic and bleeding events between 12 and 30 months were weakly correlated (rho = 0.18). The benefit-risk difference for continued thienopyridine varied from -3.7% to 19.3%, based on patient age, presentation with MI, prior PCI, heart failure/ejection fraction, diabetes, smoking status, stent type, stent diameter and PCI of a vein graft lesion. Increasing quartiles of predicted benefit-risk difference corresponded with greater overall observed reductions in ischemic events as well as smaller differences in observed bleeding rates between treatment arms at 30 months (see Figure).

Conclusions: The magnitude of expected benefit vs harm with continued DAPT beyond 12 months after PCI varies broadly among patients. A small number of variables can be used to identify patients with the greatest anticipated benefit vs harm from long-term DAPT.
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