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DAPT Score Utility for Risk Prediction in Patients With or Without Previous Myocardial Infarction

Dean J. Kereiakes, MD,[a] Robert W. Yeh, MD,[b,c,d] Joseph M. Massaro, PhD,[c,e] Donald E. Cutlip, MD,[b,c,f] P. Gabriel Steg, MD,[g,h,i,j] Stephen D. Wiviott, MD,[b,k] Laura Mauri, MD,[b,c,k] on behalf of the DAPT Study Investigators

ABSTRACT

BACKGROUND The DAPT (Dual Antiplatelet Therapy) study enrolled patients after coronary stenting. Patients randomized to continued thienopyridine and aspirin after 12 months had lower ischemic risk but higher bleeding risk than those treated with placebo and aspirin.

OBJECTIVES This study sought to determine whether a decision tool (DAPT score) aids prescription of dual antiplatelet therapy duration in patients with or without prior myocardial infarction (MI) treated with coronary stents.

METHODS Patients were categorized according to any history of MI before the index procedure or no history of MI. Risk differences during the randomized treatment period (12 to 30 months) for ischemic (MI and/or stent thrombosis) and bleeding (Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Arteries moderate/severe) events were compared according to DAPT score.

RESULTS Rates of MI were 3.8% versus 2.4% ($p = 0.01$) for patients with any MI versus no MI. Continued thienopyridine reduced late MI compared with placebo regardless of MI history (hazard ratio [HR] for any MI: 0.46; $p < 0.001$; HR for no MI: 0.60; $p = 0.003$) and increased bleeding (HR: 1.86, $p = 0.01$ any MI; HR: 1.58, $p = 0.01$ no MI). DAPT scores ≥2 were associated with reductions in MI/stent thrombosis with continued thienopyridine compared with placebo (2.7% vs. 6.0%, $p < 0.001$ any MI; 2.6% vs. 5.2%, $p = 0.002$ no MI), with comparable bleeding rates. Among patients with DAPT scores <2 in both groups, continued thienopyridine was associated with significantly increased bleeding but similar rates of ischemia.

CONCLUSIONS Patients with previous MI have greater risk of late ischemic events than those with no MI history. The DAPT score improves prediction of patient benefit and harm from continued dual antiplatelet therapy beyond assessment of MI history alone. (The Dual Antiplatelet Therapy Study; NCT00977938). (J Am Coll Cardiol 2016;67:2492–502)
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From the [a]Christ Hospital Heart and Vascular Center and The Lindner Center for Research and Education, Cincinnati, Ohio; [b]Harvard Medical School, Boston, Massachusetts; [c]Harvard Clinical Research Institute, Boston, Massachusetts; [d]The Smith Center for Outcomes Research in Cardiology, Beth Israel Deaconess Medical Center, Boston, Massachusetts; [e]Boston University School of Public Health, Boston, Massachusetts; [f]Department of Medicine, Cardiology Division, Beth Israel Deaconess Medical Center, Boston, Massachusetts; [g]Université Paris-Diderot, Paris, France; [h]INSERM U-1148, Hôpital Bichat, Paris, France; [i]Département Hospitalo-Universitaire Fibrosis, Inflammation, and Remodeling, Assistance Publique-Hôpitaux de Paris, Paris, France; [j]National Heart and Lung Institute, Institute of Cardiovascular Medicine and Science, Royal Brompton Hospital, Imperial College, London, United Kingdom; and the [k]Department of Cardiovascular Medicine, Brigham and Women's Hospital, Boston, Massachusetts. Sponsored by Harvard Clinical Research Institute. Funded by Abbott, Boston Scientific Corporation, Cordis Corporation, Medtronic, Inc., Bristol-Myers Squibb Company/Sanofi Pharmaceuticals Partnership, Eli Lilly and Company, and Daiichi-Sankyo Company Limited, and the U.S. Department of Health and Human Services (1RO1FD003870-01). Dr. Kereiakes has received research funding and is a consultant to Abbott Vascular, Boston Scientific, and Sanofi. Dr. Yeh is on an Advisory Board for Abbott Vascular and for Boston Scientific; and is a consultant for Boston Scientific, Abbott Vascular, and Merck. Dr. Massaro has received funding from Harvard Clinical Research Institute for statistical services for the manuscript. Dr. Cutlip has received research funding (paid to his institution) from Medtronic, Boston Scientific, and Celonova. Dr. Steg has received research funding from Sanofi and Servier; is a consultant for Amarin, AstraZeneca, Bayer, Boehringer Ingelheim, Bristol-Myers Squibb, CSL-Behring, Daiichi-Sankyo-Lilly, GlaxoSmithKline, Janssen, Medtronic, Merck-Sharpe Dohme, Novartis, Pfizer, Regeneron, Sanofi, Servier, and The Medicines Company; and is a stockholder in Aterovax. Dr. Wiviott has received grants and personal fees from AstraZeneca, Eli Lilly/Daiichi-Sankyo, Bristol-Myers Squibb, and Arena; grants from Eisai, Merck, and Sanofi; and personal fees

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Patients with a history of myocardial infarction (MI) or presenting with acute coronary syndrome (ACS) have higher rates of recurrent ischemia following percutaneous coronary intervention (PCI) than those presenting with stable angina; clinical practice guidelines recommend their treatment include more aggressive risk factor modification and prolonged antiplatelet therapy (1). In the DAPT (Dual Antiplatelet Therapy) study, the risks of MI and stent thrombosis (ST) beyond 1 year after PCI were reduced by continued thienopyridine therapy (clopidogrel or prasugrel) in combination with aspirin (vs. placebo plus aspirin) (2,3), with a larger absolute event reduction observed among those patients whose stent was placed as treatment for ACS (4). The PEGASUS (Prevention of Cardiovascular Events in Patients With Prior Heart Attack Using Ticagrelor Compared to Placebo on a Background of Aspirin) trial was conducted among patients with a history of MI 1 to 3 years before enrollment, but no ACS within 12 months. Continued treatment with ticagrelor in combination with aspirin (vs. placebo plus aspirin) was associated with a reduction in major adverse cardiovascular events (5). In both studies, continuation of platelet $P2Y_{12}$ inhibition was associated with increased bleeding risk.

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The DAPT score is a novel decision tool that was recently developed to determine, among patients eligible for long-term dual antiplatelet therapy, those more likely to derive benefit (vs. harm) from long-term therapy (6). The ability of the DAPT score to effectively stratify relative ischemic benefit versus bleeding risk associated with prolonged thienopyridine therapy among patients with established ischemic risk (ACS or prior MI) and those without a history of MI is unknown. Thus, we analyzed ischemic and bleeding events among patients enrolled into the DAPT study by MI status (prior MI, index MI, any MI, or no MI) and DAPT score among eligible patients randomized to continued thienopyridine (vs. placebo) therapy in combination with aspirin between 12 and 30 months following PCI.

METHODS

The DAPT study was a double-blind, international, multicenter, randomized, placebo-controlled trial designed to compare 30 with 12 months of aspirin plus thienopyridine therapy (clopidogrel or prasugrel) after coronary stenting with either drug-eluting stents or bare-metal stents. The study design (7) and results (2–4,8) have been described previously, as has the DAPT score (6).

The present exploratory analysis of patients who tolerated dual antiplatelet therapy for 1 year was designed to evaluate the risk of ischemic and bleeding events according to the time interval between presentation with MI and PCI; and determine the ability of the DAPT score to predict relative benefit (vs. harm) from continued thienopyridine therapy among individual patients beyond the benefit-risk strata conferred by MI status (any or none) alone.

STUDY POPULATION AND PROCEDURES. After PCI with either drug-eluting stents or bare-metal stents, patients who were candidates for dual antiplatelet therapy were enrolled and treated with open-label thienopyridine (clopidogrel or prasugrel) in combination with aspirin for 12 months. At 12 months, patients without a major adverse cardiovascular or cerebrovascular event, repeat revascularization, or moderate or severe bleeding but who were compliant with dual antiplatelet therapy were randomized to receive thienopyridine plus aspirin or placebo plus aspirin for an additional 18 months. At 30 months, the randomized study drug was discontinued; all patients remained on aspirin alone and were followed for another 3 months. The institutional review board at each participating institution approved the study and all patients provided written, informed consent.

For the purposes of this study, patients were categorized according to the timing of MI, with "index MI" occurring within 72 h before the index PCI, "prior MI" defined as occurring more than 72 h before the index PCI, "no MI" described patients with neither index nor prior MI, and "any MI" used to describe patients with either index or prior MI.

ENDPOINTS. All endpoints were adjudicated by a clinical events committee blinded to treatment assignment and administered by the Harvard Clinical Research Institute. A central data safety monitoring board and an independent biostatistician reviewed unblinded data from all patients on a regular basis.

ABBREVIATIONS AND ACRONYMS

ACS = acute coronary syndrome(s)

DAPT = Dual Antiplatelet Therapy

GUSTO = Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Arteries

HR = hazard ratio

MI = myocardial infarction

PCI = percutaneous coronary intervention

ST = stent thrombosis

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