(30 days to 5 years) after treatment with PES. Maarten A. Vink, MD, OLVG Hospital, Amsterdam, The Netherlands, presented findings from the 5-year clinical follow-up of the PASSION (Paclitaxel-Eluting Stent versus Bare-Metal Stent in Acute ST-Elevation Myocardial Infarction) Trial.

Many current guidelines do not consistently support the use of DES in primary percutaneous coronary intervention (PCI) for STEMI due to the lack of long-term outcome trial data. The prospective, randomized, single-blind PASSION trial set out to address the concern of late and very late stent thrombosis that is related to DES use over a 5-year follow-up period. It is the first large-scale randomized study that compared PES with BMS in an exclusively STEMI population.

PASSION included 619 consecutive patients with STEMI who were eligible for primary PCI with stenting. In the interest of focusing on a real-world population, trial exclusion was limited to cardiogenic shock prior to randomization, failed fibrinolysis, expected mortality of <6 months, and mechanical ventilation at presentation. Clinical follow-up occurred at 6, 12, 24, and 60 months. Routine angiographic follow-up was not performed. Patients were randomized to receive either PES (n=310) or BMS (n=309), and all patients received concomitant clopidogrel (300-mg loading dose followed by 75 mg daily for ≥6 months) and aspirin (100- to 500-mgmg loading dose followed by 80 to 100 mg daily indefinitely) postprocedure. GP IIb/IIIa receptor blockers were administered at the discretion of the treating physician, as were thrombus aspiration and direct stenting. The groups were well matched at baseline. The mean age was 61 years, and follow-up of all patients was obtained at 5 years.

The primary endpoint was the composite of death, reinfarction, or TLR (within 5 mm of stent edges) at 5 years. The secondary endpoints included major adverse cardiac events (MACE) at 5 years, individual components of MACE, and stent thrombosis. There was no significant difference in the occurrence of the composite primary endpoint at 5 years, nor was there any difference in the individual components (cardiac death, recurrent MI, or TLR) of the primary endpoint between the two groups. Additionally, there was no significant difference in the occurrence of individual MACE between the two groups. However, there was a slightly higher risk of very late stent thrombosis (1 to 5 years) that was associated with PES (2.5% for PES vs 0.7% for BMS). The rate of definite stent thrombosis at 5 years was 2-fold higher in the PES group (HR, 1.98; 95% CI, 0.67 to 5.79; p=0.20).

Results from the PASSION trial indicate that the long-term risk of cardiac death, MI, or TLR is similar for PES and BMS. The risk of late stent thrombosis is increased slightly with PES, and this risk appears to persist over time. Therefore, clinicians may want to consider the risk versus benefit of PES when choosing a treatment strategy for patients with acute STEMI.

Ticagrelor May Be an Effective Alternative to Clopidogrel in Patients with ACS Who Subsequently Undergo CABG

In patients with acute coronary syndrome (ACS) who are undergoing coronary artery bypass grafting (CABG), treatment with ticagrelor within 7 days prior to surgery is associated with lower rates of mortality after CABG and comparable rates of CABG-related bleeding compared with clopidogrel. The oral, reversibly binding $P2Y_{12}$ antagonist ticagrelor provides greater inhibition of platelet aggregation and a faster offset than clopidogrel, which is an irreversible platelet inhibitor. Findings from a retrospective analysis of the nonrandomized subgroup of patients who required CABG (n=1261) within 7 days of last intake of study drug from the Platelet Inhibition and Patient Outcomes (PLATO; NCT00391872) study, comparing ticagrelor and clopidogrel, were presented by Claes Held, MD, PhD, Uppsala Clinical Research Center, Uppsala, Sweden.

Current ACS guidelines recommend dual antiplatelet therapy with aspirin and clopidogrel for at least 12 months and that clopidogrel be withheld for at least 5 days prior to CABG. However, this is not always possible, as urgent situations may necessitate surgery prior to 5 days after treatment cessation.

The PLATO-CABG analysis included 1261 patients with ACS, of whom 632 were treated with ticagrelor and 629 were treated with clopidogrel. The median age was 64 years, and 81% was male. Approximately 90% of patients underwent coronary angiography at study entry, and approximately 19% underwent percutaneous coronary intervention (PCI) within 24 hours of randomization. The primary efficacy endpoint was the composite of cardiovascular (CV) death, myocardial infraction (MI), or stroke at 12 months post-CABG. The primary safety endpoint was total major bleeding (as defined according to the Global Use of Strategies to Open (GUSTO) occluded coronary arteries guidelines) from time of CABG. The secondary endpoints included the individual components of the primary efficacy endpoint (CV death, MI, and stroke) as well as all-cause mortality and non-CV death.

There was no significant difference between ticagrelor and clopidogrel therapy with regard to the composite primary efficacy endpoint (10.5% vs 12.6%; HR, 0.84; 95% CI 0.60 to 1.16; p=0.29). However, the rate of CV death was significantly lower in the ticagrelor group (4.1% vs

7.9% in the clopidogrel group; p<0.01), with most deaths occurring shortly after CABG and within the first month postprocedure (HR, 0.52; 95% CI, 0.32 to 0.85; p<0.01). The incidence of all-cause mortality was also lower in the ticagrelor group (HR, 0.49; 95% CI, 0.32 to 0.77; p=0.002). There was no reduction in the risk of MI (HR, 1.06; 95% CI, 0.66 to 1.68; p=0.82) or stroke (HR, 1.17; 95% CI, 0.53 to 2.62; p=0.70) with ticagrelor.

Overall, rates of CABG-related bleeding were high in PLATO, which Prof. Claes attributes to the bleeding definitions that were applied in the study, but these rates were not different between ticagrelor and clopidogrel (CABG-Related Major Bleeding 81.2% vs 80.1%; HR, 1.07; 95% CI, 0.80 to 1.43; p=0.67). In addition, there was no significant difference in bleeding when broken down by subtype (ie, major bleeding, life-threatening bleeding, fatal bleeding, TIMI major bleeding, TIMI minor bleeding, and GUSTO severe bleeding).

While these results suggest a reduction in CV death and all-cause mortality in ACS patients who are in need of urgent CABG, the study is a retrospective analysis of a nonrandomized post hoc subgroup, and as such, they are not conclusive, as the findings may have been affected by bias and confounding. The use of ticagrelor in these patients is not associated with an increase in major bleeding, as measured by PLATO definitions, compared with clopidogrel. The findings in the CABG cohort are consistent with the main study outcomes in terms of mortality; however, the reason for the lack of reduction in MI is unclear. A retrospective central review of the causes of post-CABG death are ongoing, as the PLATO-CABG study distinguished between vascular and nonvascular causes but did not investigate further subcategories.

RA Versus SV Grafts in CABG: Is There a Preferred Strategy?

Arterial conduits (particularly the left internal mammary artery [LIMA]) have been shown to be superior to saphenous vein (SV) grafts in terms of long-term patency in patients with coronary artery disease (CAD) who are undergoing coronary artery bypass grafting (CABG). Although the LIMA is the arterial conduit of choice, patients who require more than one bypass must receive either a second arterial graft or a vein graft. While the radial artery is the most frequently used arterial graft in this setting—because it is the easiest to harvest—there is little data concerning its long-term graft patency.

The CABG arm of the prospective, randomized Veterans Administration (VA) Cooperative Study, also known as CSP-474, included 733 patients with stable CAD who were undergoing elective CABG with a LIMA and needed at least one other graft. Findings from CSP-474 were presented by Steven Goldman, MD, Tucson VA Hospital, Tucson, AZ.

Patients were randomized to either radial artery graft (RA; n=366) or SV graft (SV; n=367) to the best recipient vessel. Angiographic assessment was performed at one week and one year post-CABG (completed in 73%) in order to monitor disease progression. There was 89% power to detect a difference in the primary endpoint of angiographic patency at one year. The secondary endpoints included difference in selective graft patency (distal anastomosis to the left anterior descending, circumflex, or right coronary artery) between RA and SV at one year, high-grade disease (string sign) in the graft, and endoscopic harvesting. Other analyses included patency data on cardiopulmonary bypass pump versus "off pump," cost analyses, and quality-of-life assessment at 3 months and one year.

There was no difference in angiographic patency at one year between RA and SV (89% for both). One-week patency rates were also similar (99% for RA vs 97% for SV). There was no difference between RA and SV in the secondary endpoint of selective graft patency at any target. More high-grade disease (defined as a string sign) was observed in the RA group (8%) compared with the SV group (1%; p<0.001), though these rates remained quite low. Endoscopic harvest of SV was associated with lower patency rates compared with traditional harvest of the SV (78% vs 91%; p=0.009), but there was no significant difference in RA patency rates (100% vs 89%) that were dependent on mode of harvest. Additionally, complication rates that were associated with RA and SV were low compared with similar cohorts. At one year, the rate of stroke was 2.0%, the rate of death was 2.0%, and the rate of MI was 1.0%. Operative mortality occurred in 0.7% of patients.

Use of cardiopulmonary bypass (ie, "on" versus "off pump") did not appear to impact RA patency (89% for both). However, higher patency was observed in SV patients who were on pump (90% vs 78%). It is important to note that these data are based on a small number of participants (off-pump patients n=41 for RA and n=48 for SV) and may not be reflective of outcomes that are expected from a real-world population. Quality-of-life assessments for both study groups were comparable at 3 months and one year. While overall hospital costs were similar for the two groups, surgical costs were higher for RA compared with SV ($13,629 vs $12,484 for SV; p<0.001).

In patients with stable CAD who are undergoing CABG with a LIMA and are in need of at least one other graft, RA is not superior to SV in terms of patency at one year. The CSP-424 study is ongoing, and angiographic data will be evaluated during a planned 5-year angiographic follow-up.