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CLINICAL RESEARCH

CORONARY

Percutaneous Coronary Intervention in Native Coronary Arteries Versus Bypass Grafts in Patients With Prior Coronary Artery Bypass Graft Surgery

Insights From the Veterans Affairs Clinical Assessment, Reporting, and Tracking Program

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ABSTRACT

OBJECTIVES The aim of this study was to examine the frequency, associations, and outcomes of native coronary artery versus bypass graft percutaneous coronary intervention (PCI) in patients with prior coronary artery bypass grafting (CABG) in the Veterans Affairs (VA) integrated health care system.

BACKGROUND Patients with prior CABG surgery often undergo PCI, but the association between PCI target vessel and short- and long-term outcomes has received limited study.

METHODS A national cohort of 11,118 veterans with prior CABG who underwent PCI between October 2005 and September 2013 at 67 VA hospitals was examined, and the outcomes of patients who underwent native coronary versus bypass graft PCI were compared. Logistic regression with generalized estimating equations was used to adjust for correlation between patients within hospitals. Cox regressions were modeled for each outcome to determine the variables with significant hazard ratios (HRs).

RESULTS During the study period, patients with prior CABG represented 18.5% of all patients undergoing PCI (11,118 of 60,171). The PCI target vessel was a native coronary artery in 73.4% and a bypass graft in 26.6%: 25.0% in a saphenous vein graft and 1.5% in an arterial graft. Compared with patients undergoing native coronary artery PCI, those undergoing bypass graft PCI had higher risk characteristics and more procedure-related complications. During a median follow-up period of 3.11 years, bypass graft PCI was associated with significantly higher mortality (adjusted HR: 1.30; 95% confidence interval: 1.18 to 1.42), myocardial infarction (adjusted HR: 1.61; 95% confidence interval: 1.43 to 1.82), and repeat revascularization (adjusted HR: 1.60; 95% confidence interval: 1.50 to 1.71).

CONCLUSIONS In a national cohort of veterans, almost three-quarters of PCIs performed in patients with prior CABG involved native coronary artery lesions. Compared with native coronary PCI, bypass graft PCI was significantly associated with higher incidence of short- and long-term major adverse events, including more than double the rate of in-hospital mortality. (J Am Coll Cardiol Intv 2016;9:884–93) © 2016 by the American College of Cardiology Foundation.

It is widely believed that native coronary arteries should be the preferred target of percutaneous coronary intervention (PCI) in patients with prior coronary artery bypass graft (CABG) surgery, if technically feasible, because native coronary artery PCI appears to be associated with better short-and long-term outcomes compared with bypass graft PCI. However, there are limited data to substantiate this belief (1–6).

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We previously reported that patients with prior CABG undergoing PCI between 2004 and 2009 in the National Cardiovascular Data Registry (NCDR) Cath-PCI Registry represented 17.5% of the total PCI volume (300,902 of 1,721,046) during that period (7). The PCI target was a native coronary artery in 62.5% and a bypass graft in 37.5%: saphenous vein graft (SVG) (104,678 [34.9%]), arterial graft (7,517 [2.5%]), or both arterial graft and SVG (718 [0.2%]). Compared with patients undergoing native coronary artery PCI, those undergoing bypass graft PCI had higher risk characteristics and more procedural complications (7). However, clinical practice has evolved since, and prior analyses were limited to periprocedural and in-hospital outcomes, which are known to be worse in patients who undergo bypass graft interventions. The impact of target vessel on long-term outcomes has received limited study (3,4,6).

The goals of the present study were to: 1) determine the frequency of prior CABG among veterans undergoing PCI in the Veterans Affairs (VA) system; 2) examine the target vessel (native coronary artery vs. SVG vs. arterial graft) in those patients; and 3) compare the immediate post-procedural and long-term outcomes after PCI in native coronary arteries versus coronary bypass grafts.

METHODS

STUDY DESIGN, SETTING, AND POPULATION. We performed a retrospective study of a national cohort of post-CABG veterans who underwent PCI at 67 VA PCI centers from October 1, 2005, through September 30, 2013. For patients who underwent multiple procedures during the study period, the first PCI was defined as the index procedure, and outcomes were assessed through September 30, 2014.

DATA SOURCE. The VA Clinical Assessment, Reporting, and Tracking (CART) program is a national clinical quality improvement program among VA

ABBREVIATIONS AND ACRONYMS

CABG = coronary artery bypass graft

CART = Clinical Assessment, Reporting, and Tracking

CI = confidence interval

DES = drug-eluting stent(s)

MI = myocardial infarction

NCDR = National Cardiovascular Data Registry

OR = odds ratio

PCI = percutaneous coronary intervention

SVG = saphenous vein graft

VA = Veterans Affairs

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