



Risk factors for 30-day unplanned readmission following infrainguinal endovascular interventions



Thomas C. F. Bodewes, MD,^{a,b} Peter A. Soden, MD,^a Klaas H. J. Ultee, BSc,^{a,c} Sara L. Zettervall, MD,^{a,d} Alexander B. Pothof, MD,^{a,b} Sarah E. Deery, MD,^{a,e} Frans L. Moll, MD, PhD,^b and Marc L. Schermerhorn, MD,^a Boston, Mass; Utrecht and Rotterdam, The Netherlands; and Washington, D.C.

CME Activity

Purpose or Statement of Need The purpose of this journal-based CME activity is to enhance the vascular specialist's ability to diagnose and care for patients with the entire spectrum of circulatory disease through a comprehensive review of contemporary vascular surgical and endovascular literature.

Learning Objectives At the end of this activity, participants should

- Predict which patients who undergo an endovascular procedure for CLI are likely to require readmission to the hospital and to develop strategies to prevent readmission.

Target Audience This activity is designed for vascular surgeons and individuals in related specialties.

Authors Disclosure Information Authors of all Journal of Vascular Surgery articles disclose relevant financial relationships with the manufacturer(s) of any of the products or provider(s) of any of the services discussed in their article. Disclosures appear in the section labeled "Author Conflict of Interest." If the authors of the article have no relationships to disclose, "none" will be listed in this section.

Editors and Reviewer Disclosure Information JVS Editors (editors, associate editors, assistant editors) have no relevant financial relationships to disclose per the Society for Vascular Surgery policy that requires JVS Editors have no direct financial relationships with industry during their terms of service. The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

Instructions on Participation and Receiving Credit The CME Program is free for journal subscribers. Nonsubscribers will be required to pay \$10 per exam certificate. This activity is designed to be completed within one hour; physicians should claim only those credits that reflect the time actually spent in the activity. To successfully

earn credit, participants must complete the activity online during the valid period. One year from the release date, tests will expire and credit will no longer be offered.

Follow these steps to earn AMA PRA Category 1 Credit

1. Review the accreditation information, learning objectives, target audience and author disclosures for the article.
2. Read the article in print or online at <http://www.jvascsurg.org>.
3. Complete the exam and evaluation online at <http://www.jvascsurg.org/cme/home>.
4. All questions must be answered correctly to obtain credit.
5. Print a certificate of credit.

Date of Release February 1, 2017 **Expiration** February 28, 2018

Hardware/Software Requirements Internet Access and Adobe Acrobat Reader

Policy on Privacy and Confidentiality JVS is owned by the Society for Vascular Surgery. The Society for Vascular Surgery privacy policy states that it will not share or sell the information entered in the CME exam module accessed through the JVS Web site. The Rievent system issues the CME certificate on behalf of the Society for Vascular Surgery. The personal, identifiable information from this CME activity is stored within the Rievent system. Only employees who prepare documents for the CME recipient, maintain records, and/or solve customer questions have access to personal information.

Questions Society for Vascular Surgery Phone: 800-258-7188; education@vascularsociety.org

ABSTRACT

Objective: Unplanned hospital readmissions following surgical interventions are associated with adverse events and contribute to increasing health care costs. Despite numerous studies defining risk factors following lower extremity bypass surgery, evidence regarding readmission after endovascular interventions is limited. This study aimed to identify predictors of 30-day unplanned readmission following infrainguinal endovascular interventions.

Methods: We identified all patients undergoing an infrainguinal endovascular intervention in the targeted vascular module of the American College of Surgeons National Surgical Quality Improvement Program between 2012 and 2014. Perioperative outcomes were stratified by symptom status (chronic limb-threatening ischemia [CLI] vs claudication). Patients who died during index admission and those who remained in the hospital after 30 days were excluded. Indications for unplanned readmission related to the index procedure were evaluated. Multivariable logistic regression was used to identify preoperative and in-hospital (during index admission) risk factors of 30-day unplanned readmission.

Results: There were 4449 patients who underwent infrainguinal endovascular intervention, of whom 2802 (63%) had CLI (66% tissue loss) and 1647 (37%) had claudication. The unplanned readmission rates for CLI and claudication patients were 16% (n = 447) and 6.5% (n = 107), respectively. Mortality after index admission was higher for readmitted patients

From the Division of Vascular and Endovascular Surgery, Department of Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston^a; the Department of Vascular Surgery, University Medical Center, Utrecht^b; the Department of Vascular Surgery, Erasmus University Medical Center, Rotterdam^c; the Department of Surgery, George Washington University Medical Center, Washington, D.C.^d; and the Department of Surgery, Massachusetts General Hospital, Boston.^e

Supported by the NIH T32 Harvard-Longwood Research Training in Vascular Surgery grant HL007734.

Author conflict of interest: none.

Presented as a poster at the 2016 Vascular Annual Meeting of the Society for Vascular Surgery, National Harbor, Md, June 8-11, 2016.

Additional material for this article may be found online at www.jvascsurg.org.

Correspondence: Marc L. Schermerhorn, MD, 110 Francis St, Ste 5B, Boston, MA 02215 (e-mail: mscherm@bidmc.harvard.edu).

The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

0741-5214

Copyright © 2016 by the Society for Vascular Surgery. Published by Elsevier Inc. <http://dx.doi.org/10.1016/j.jvs.2016.08.093>

compared with those not readmitted (CLI, 3.4% vs 0.7% [$P < .001$]; claudication, 2.8% vs 0.1% [$P < .01$]). Approximately 50% of all unplanned readmissions were related to the index procedure. Among CLI patients, the most common indication for readmission related to the index procedure was wound or infection related (42%), whereas patients with claudication were mainly readmitted for recurrent symptoms of peripheral vascular disease (28%). In patients with CLI, predictors of unplanned readmission included diabetes (odds ratio, 1.3; 95% confidence interval, 1.01-1.6), congestive heart failure (1.6; 1.1-2.5), renal insufficiency (1.7; 1.3-2.2), preoperative dialysis (1.4; 1.02-1.9), tibial angioplasty/stenting (1.3; 1.04-1.6), in-hospital bleeding (1.9; 1.04-3.5), in-hospital unplanned return to the operating room (1.9; 1.1-3.5), and discharge other than to home (1.5; 1.1-2.0). Risk factors for those with claudication were dependent functional status (3.5; 1.4-8.7), smoking (1.6; 1.02-2.5), diabetes (1.5; 1.01-2.3), preoperative dialysis (3.6; 1.6-8.3), procedure time exceeding 120 minutes (1.8; 1.1-2.7), in-hospital bleeding (2.9; 1.2-7.4), and in-hospital unplanned return to the operating room (3.4; 1.2-9.4).

Conclusions: Unplanned readmission after endovascular treatment is relatively common, especially in patients with CLI, and is associated with substantially increased mortality. Awareness of these risk factors will help providers identify patients at high risk who may benefit from early surveillance, and prophylactic measures focused on decreasing postoperative complications may reduce the rate of readmission. (J Vasc Surg 2017;65:484-94.)

Unplanned readmissions following surgical intervention are associated with poor outcomes and additional health care costs.¹ In 2004, it was estimated that the costs of potentially avoidable rehospitalizations were as high as \$17.4 billion among Medicare beneficiaries.² Consequently, several regional and national initiatives began focusing on this issue.^{3,4} The federal government also made this issue a priority with the Hospital Readmission Reduction Program, introduced in 2012 as a part of the Affordable Care Act, which was initiated to impose financial penalties against hospitals with excessive readmissions within 30 days of discharge for Medicare beneficiaries. An algorithm was developed to omit planned readmissions from the penalty calculation; however, hospitals are accountable for all-cause unplanned readmissions, including those not related to the initial admission. Whereas the readmission rates nationwide remained stable between 2007 and 2011, after initiation of this policy, rates declined slightly by 0.5%.⁵ Within this Act, conditions known to have a particularly high risk of readmission (myocardial infarction, heart failure, and pneumonia) were identified as target areas, with vascular procedures a likely target in the near future. Subsequently, the readmission rate continued to decline in 2015 for both targeted and nontargeted conditions, with 17.8% and 13.1% of all Medicare beneficiaries readmitted within 30 days, respectively.⁶

Readmission following vascular surgery is higher than for other major operations, with prior reports citing a range of 18% to 24% compared with 10% for general, bariatric, and colorectal surgery.^{1,2} Among vascular surgery patients, those undergoing lower extremity open or endovascular procedures have among the highest risk for readmission with a reported rate of 23%, third only to congestive heart failure and psychoses. Previous studies have identified several risk factors following infrainguinal bypass surgery, including age, diabetes, renal insufficiency, chronic limb-threatening ischemia (CLI), return to the operating room during the index admission, and longer hospital stay.⁷⁻¹²

Despite that endovascular procedures are now the most commonly used method for lower extremity revascularization, predictors of readmission after infrainguinal endovascular intervention are limited.^{13,14} Although Davenport et al¹⁵ analyzed readmission data for both open and endovascular interventions, no predictors specific to endovascular procedures were identified. In addition, Vogel et al¹⁶ evaluated outcomes in only a limited set of patients who underwent tibioperoneal angioplasty for CLI in the U.S. Medicare population.

Therefore, the purpose of this study was to assess the incidence of 30-day unplanned readmission following infrainguinal endovascular intervention and to identify preoperative and in-hospital risk factors using a large national representative clinical registry.

METHODS

Data source. Patients were identified using the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) targeted vascular module. NSQIP is a prospective clinical registry of surgical perioperative outcomes collected nationwide for the purpose of quality assessment and improvement. The registry consists of patient demographic, operative, and postoperative variables up to 30 days after surgery. The targeted vascular module contains additional detailed anatomic and intraoperative characteristics as well as procedure-related outcomes from 83 participating sites. According to NSQIP protocol, trained clinical nurses first identify surgical procedures by reviewing operative case logs, then collect data and categorize these procedures using Current Procedural Terminology (CPT) codes. Although not all cases are included, a systematic sampling system was developed by NSQIP to select cases and to prevent bias in selection. Data collection and quality control have been validated by annual audits and previous reports.¹⁷⁻¹⁹ In 2011, NSQIP began collecting 30-day readmission events; however, the time to readmission, indication, and whether the readmission was related to the principal procedure became available only in 2012. Therefore, the data were

Download English Version:

<https://daneshyari.com/en/article/5617417>

Download Persian Version:

<https://daneshyari.com/article/5617417>

[Daneshyari.com](https://daneshyari.com)