

Nonselective carotid artery ultrasound screening in patients undergoing coronary artery bypass grafting: Is it necessary?

Khalil Masabni, MD,^a Joseph F. Sabik III, MD,^a Sajjad Raza, MD,^a Theresa Carnes, MPH,^b Hemantha Koduri, MD,^c Jay J. Idrees, MD,^a Jocelyn Beach, MD,^d Haris Riaz, MD,^e Mehdi H. Shishehbor, DO, MPH, PhD,^f Heather L. Gornik, MD,^c and Eugene H. Blackstone, MD^{a,b}

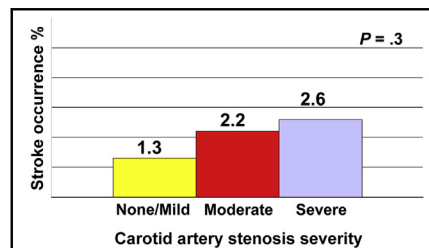
ABSTRACT

Objectives: To determine whether nonselective preoperative carotid artery ultrasound screening alters management of patients scheduled for coronary artery bypass grafting (CABG), and whether such screening affects neurologic outcomes.

Methods: From March 2011 to September 2013, preoperative carotid artery ultrasound screening was performed on 1236 of 1382 patients (89%) scheduled to undergo CABG. Carotid artery stenosis (CAS) was classified as none or mild (any type 0%-59% stenosis), moderate (unilateral 60%-79% stenosis), or severe (bilateral 60%-79% stenosis or unilateral 80%-100% stenosis).

Results: A total of 1069 (86%) had <moderate; 90 (7.3%) had moderate; and 77 (6.2%) had severe CAS. Of those with moderate CAS, 4 (4.4%) had preoperative confirmatory testing, and 1 (1.1%) underwent combined CABG + carotid endarterectomy (CEA); 11 (12%) had off-pump surgery. Of those with severe CAS, 18 (23%) had confirmatory testing, and 18 (23%) underwent combined CABG + CEA; 6 (7.8%) had off-pump surgery. Stroke occurred in 14 of 1069 (1.3%) patients with <moderate CAS; 2 of 90 (2.2%) of those with moderate CAS; and 2 of 77 (2.6%) of those with severe CAS ($P = .3$). In patients with \geq moderate CAS, 1 of 19 (5.3%) undergoing CABG + CEA and 3 of 148 (2.0%) undergoing CABG alone experienced stroke ($P = .4$). In patients with moderate CAS, stroke occurred in 1 of 11 (9.1%) off-pump and 1 of 79 (1.3%) on-pump patients ($P = .2$). In patients with severe CAS, stroke occurred in 1 of 6 (17%) off-pump and 1 of 71 (1.4%) on-pump patients ($P = .15$).

Conclusions: Routine preoperative carotid artery evaluation altered the management of a minority of patients undergoing CABG; this did not translate into perioperative stroke risk. Hence, a more targeted approach for preoperative carotid artery evaluation should be adopted. (*J Thorac Cardiovasc Surg* 2016;151:402-9)



Stroke occurrence by severity of carotid artery stenosis in patients undergoing coronary artery bypass grafting.

Central Message

Routine, as opposed to selective, preoperative carotid artery ultrasound screening before coronary artery bypass grafting is of questionable value.

Perspective

Routine preoperative carotid artery evaluation altered the management of a minority of patients undergoing CABG. These changes in management did not decrease the prevalence of perioperative stroke. Hence, in patients undergoing CABG, a more targeted approach for preoperative carotid artery evaluation should be adopted.

See Editorial Commentary page 410.

Stroke is a devastating complication of coronary artery bypass grafting (CABG)¹ that is associated with substantial morbidity, mortality, and costs for both patients and healthcare systems. With the expectation of reducing the

occurrence of perioperative stroke, some groups routinely screen patients before CABG to identify carotid artery disease that they believe requires revascularization before or during CABG.²⁻⁷ In 2011, we implemented a quality

From the Departments of ^aThoracic and Cardiovascular Surgery, ^cVascular Medicine, ^dVascular Surgery, and ^eCardiovascular Medicine, Heart and Vascular Institute; ^bDepartment of Quantitative Health Sciences, Research Institute; and ^fDepartment of Internal Medicine, Medicine Institute, Cleveland Clinic, Cleveland, Ohio.

This study was supported in part by the Sheikh Hamdan bin Rashid Al Maktoum Distinguished Chair in Thoracic and Cardiovascular Surgery, held by J.F.S.; the Kenneth Gee and Paula Shaw, PhD, Chair in Heart Research, held by E.H.B.; and the Gus P. Karos Registry Fund. The individuals for whom these funding sources are named played no role in the collection of data or analysis and interpretation of the data, and had no right to approve or disapprove publication of the finished article.

Read at the 95th Annual Meeting of The American Association for Thoracic Surgery, Seattle, Washington, April 25-29, 2015.

Received for publication April 28, 2015; revisions received Sept 14, 2015; accepted for publication Sept 26, 2015; available ahead of print Nov 13, 2015.

Address for reprints: Joseph F. Sabik III, MD, Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic, 9500 Euclid Ave/Desk J4-1, Cleveland, OH 44195 (E-mail: sabikj@ccf.org).

0022-5223/\$36.00

Copyright © 2016 by The American Association for Thoracic Surgery

<http://dx.doi.org/10.1016/j.jtcvs.2015.09.108>

Abbreviations and Acronyms

CABG = coronary artery bypass grafting
CEA = carotid endarterectomy

Scanning this QR code will take you to the article title page. To view the AATS 2015 Webcast, see the URL at the end of the article.



improvement protocol to reduce the occurrence of strokes, which included universal carotid artery screening. The purposes of this study were to determine whether this quality improvement protocol (1) altered the management of patients scheduled to undergo isolated CABG, and (2) affected neurologic outcomes.

METHODS

Patients

From March 2011 to September 2013, nonselective carotid artery ultrasound screening was performed prospectively on 1236 of 1382 (89%) patients scheduled to undergo isolated CABG at Cleveland Clinic. Preoperative, operative, and postoperative variables were retrieved from the Cardiovascular Information Registry, a database populated concurrently with patient care information. Medical records of all patients who were recorded as having carotid artery stenosis, identified on screening ultrasound, were reviewed to identify any change in perioperative management that occurred on that basis. Medical and imaging records of patients experiencing an adverse neurologic event were reviewed. The average age of screened patients was 65 ± 10 years, and 75% were male, with no statistically significant differences between those who were, versus were not, screened (Table 1). Data used in this study were approved for use in this quality improvement project by the Cleveland Clinic Institutional Review Board.

Carotid Artery Screening

Most of the carotid duplex ultrasound examinations (92%) were performed in the Non-Invasive Vascular Laboratory of Cleveland Clinic, a facility accredited by the Intersocietal Accreditation Commission (www.intersocietal.org) in extracranial cerebrovascular testing. Studies were performed by registered vascular technologists using a standardized scanning protocol, and interpreted by vascular medicine specialists and vascular surgeons certified in vascular interpretation. Duplex ultrasound examination findings and results were entered into an electronic database at the time of interpretation. The median interval from screening ultrasound to CABG was 4 days, with 90% performed within 16 days. Each internal carotid artery was graded and categorized according to the severity of stenosis, based on standardized laboratory diagnostic criteria,⁸ including internal carotid artery peak systolic and end-diastolic velocities and presence of atherosclerotic plaque.

Results of the carotid artery ultrasound were classified as follows: no stenosis or mild stenosis (any type <60%, including categories 0%-19%, 20%-39%, and 40%-59%); moderate stenosis (unilateral, 60%-79% stenosis of either internal carotid artery); or severe stenosis

(bilateral 60%-79% stenosis; unilateral or bilateral 80%-99% stenosis, or 100% occlusion). For patients who underwent preoperative carotid duplex ultrasound outside Cleveland Clinic (1%) or in the radiology department at Cleveland Clinic (7%), available study examination imaging or report of ultrasound velocity findings were used by a single investigator (H.K.) to grade the severity of carotid stenosis, using the standardized diagnostic criteria of the Cleveland Clinic Non-Invasive Vascular Laboratory.

Endpoints

Perioperative stroke was defined as any new focal or global neurologic deficit lasting >24 hours that could not be explained by another medical process. This included persistent neurologic deficit for >72 hours, and reversible ischemic neurologic deficit and recovery within 72 hours; excluded was transient ischemic attack with recovery within 24 hours. Temporal onset of stroke was classified as intraoperative if the neurologic deficit was present when the patient awoke from anesthesia, and postoperative if the deficit developed after the patient emerged from anesthesia.

Statistical Analysis

All analyses were performed using SAS, version 9.2 software (SAS Institute, Cary, NC). Continuous variables are summarized as mean \pm SD, or as equivalent 15th, 50th (median), and 85th percentiles when the distribution of values is skewed. Categorical data are summarized by frequencies and percentages.

RESULTS

Screening Results

Among the 1236 patients who had preoperative carotid ultrasound screening, 1069 (86%) had no stenosis or mild stenosis, 90 (7.3%) had moderate stenosis, and 77 (6.2%) had severe stenosis (Figure 1). Patients with no stenosis or mild stenosis were younger than patients with moderate or severe stenosis. More of the patients with moderate or severe stenosis were women, and had heart failure, peripheral arterial disease, and a history of stroke and smoking (Table 1). Of those with moderate stenosis, most lesions were unilateral, equally distributed on the right (50%) and left sides (50%; Table 2). Ten (11%) of these patients had a history of stroke. Of those with severe stenosis, it was most commonly bilateral (48%; Table 3). Twelve (16%) of these patients had a history of stroke.

Management

Of those with moderate carotid artery stenosis, 4 (4.4%) had preoperative confirmatory testing (computed tomography angiography), and only 1 (1.1%) underwent combined CABG and carotid endarterectomy (CABG + CEA). The latter patient had no history of stroke and was found to have severe carotid stenosis on confirmatory testing. Of those with severe stenosis, 18 (23%) had confirmatory testing (computed tomography angiography = 16, magnetic resonance angiography = 1, angiogram = 1), and 18 (23%) underwent CABG + CEA. Of the 18 undergoing CABG + CEA, 3 had a history of stroke; CABG + CEA was performed under the same anesthesia, with carotid

Download English Version:

<https://daneshyari.com/en/article/2978962>

Download Persian Version:

<https://daneshyari.com/article/2978962>

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