Journal of the American College of Cardiology
© 2013 by the American College of Cardiology Foundation
Published by Elsevier Inc.

Vol. 62, No. 24, 2013
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2013.07.086

Patient and Hospital Characteristics Associated With Inappropriate Percutaneous Coronary Interventions

Paul S. Chan, MD, MSc,*† Sunil V. Rao, MD,‡ Deepak L. Bhatt, MD, MPH,§‖
John S. Rumsfeld, MD, PhD,¶ Hitinder S. Gurm, MD,# Brahmajee K. Nallamothu, MD, MPH,#**††
Matthew A. Cavender, MD, MPH,‖ Kevin F. Kennedy, MS,* John A. Spertus, MD*†

Kansas City, Missouri; Boston, Massachusetts; Denver, Colorado; and Ann Arbor, Michigan

Objectives This study sought to examine whether rates of inappropriate percutaneous coronary intervention (PCI) differ by demographic characteristics and insurance status.

Background Prior studies have found that blacks, women, and those who have public or no health insurance are less likely to undergo PCI. Whether this reflects potential overuse in whites, men, and privately insured patients, in addition to underuse in disadvantaged populations, is unknown.

Methods Within the National Cardiovascular Data Registry CathPCI Registry, we identified 221,254 nonacute PCIs performed between July 2009 and March 2011. The appropriateness of PCI was determined using the Appropriate Use Criteria for coronary revascularization. Multivariable hierarchical regression was used to evaluate the association between patient demographics and insurance status and inappropriate PCI, as defined by the Appropriate Use Criteria.

Results Of 211,254 nonacute PCIs, 25,749 (12.2%) were classified as inappropriate. After multivariable adjustment, men (adjusted odd ratio [OR]: 1.08 [95% CI: 1.05 to 1.11]; $p < 0.001$) and whites (adjusted OR: 1.09 [95% CI: 1.05 to 1.14]; $p < 0.001$) were more likely to undergo an inappropriate PCI in comparison with women and nonwhites. Compared with privately insured patients, those who had Medicare (adjusted OR: 0.85 [95% CI: 0.83 to 0.88]), other public insurance (adjusted OR: 0.78 [95% CI: 0.73 to 0.83]), and no insurance (adjusted OR: 0.56 [95% CI: 0.50 to 0.61]) were less likely to undergo an inappropriate PCI ($p < 0.001$). In addition, compared with urban hospitals, those admitted at rural hospitals were less likely to undergo inappropriate PCI, whereas those at suburban hospitals were more likely.

Conclusions For nonacute indications, PCIs categorized as inappropriate were more commonly performed in men, whites, and those who had private insurance. Higher rates of PCI in these patient populations may, in part, be due to procedural overuse. (J Am Coll Cardiol 2013;62:2274–81) © 2013 by the American College of Cardiology Foundation

From the *Saint Luke's Mid America Heart Institute, Kansas City, Missouri; †University of Missouri-Kansas City, Kansas City, Missouri; ‡Duke Clinical Research Institute, Durham, North Carolina; §VA Boston Healthcare System, Boston, Massachusetts; ‖Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts; ¶Denver VA Medical Center, Denver, Colorado; #University of Michigan, Ann Arbor, Michigan; **VA Health Services Research and Development Center of Excellence, VA Ann Arbor Healthcare System, Ann Arbor, Michigan; and the ††Center for Healthcare Outcomes and Policy, Ann Arbor, Michigan. The underlying research reported in the article was funded by the U.S. National Institute of Health and by the American College of Cardiology Foundation's National Cardiovascular Data Registry. The views expressed in this manuscript represent those of the authors, and do not necessarily represent the official views of the NCDR or its associated professional societies identified at www.ncdr.com/. Dr. Chan has received a Career Development Grant Award (K23HL102224) from the National Heart, Lung, and Blood Institute, has an industry relationship with the American Heart Association and Optum Rx as a consultant, and is on the steering committee of Johnson and Johnson. Dr. Bhatt is a member of the Advisory Board of *Elsevier Practice Update Cardiology*, *Medscape Cardiology*, and *Regado Biosciences*; is a member of the Board of Directors of the Boston VA Research Institute and the Society of Chest Pain Centers; is Chair of the American Heart Association Get With The Guidelines Science Subcommittee; has received honoraria from the American College of Cardiology (as Editor of *Clinical Trials, Cardiosource*), Belvoir Publications (as Editor in Chief of *Harvard Heart Letter*), Duke Clinical Research Institute (on the clinical trial steering and data monitoring committees), Population Health Research Institute (on the clinical trial steering committee), Slack Publications (as Chief Medical Editor of *Cardiology Today Intervention*), and WebMD (on the CME steering committees), is Senior Associate Editor of the *Journal of Invasive Cardiology*; has received research grants from Amarin, AstraZeneca, Bristol-Myers Squibb, Eisai, Ethicon, Medtronic, Sanofi Aventis, and The Medicines Company; and has received unfunded research from FlowCo, PLx Pharma, and Takeda. Dr. Cavender has received research grants through Brigham and Women's Hospital from AstraZeneca and Bristol-Myers Squibb. Dr. Spertus is the principal investigator of a contract from the American College of Cardiology Foundation to analyze the National Cardiovascular Data Registry (NCDR) databases; serves on the Scientific Advisory Board for United Healthcare, and has consulted for Gilead, Genentech, Amgen, and St. Jude; has received research grants from National Heart, Lung, and Blood Institute, American Heart Association, Gilead, Lilly, Amorcyte, and EvaHeart; has an equity position in Health Outcomes Sciences; and owns the copyright to the Seattle Angina Questionnaire, Kansas City Cardiomyopathy Questionnaire, and the Peripheral Artery Questionnaire. Dr. Rumsfeld is Chief Science Officer for the NCDR. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received July 8, 2013; accepted July 25, 2013.

Percutaneous coronary intervention (PCI) improves survival in patients with acute myocardial infarction and has the potential to reduce morbidity and improve quality of life in other settings. The use of PCI accounts for approximately 600,000 procedures (1) and $12 billion in healthcare spending annually in the United States (2). However, prior studies have reported lower rates of PCI among blacks, women, and those who have public or no health insurance (3, 4). Whether these differences are due to underuse in these traditionally vulnerable populations, or overuse in whites, men, and those who have private health insurance, or both, is unknown.

See page 2282

Now, with the development of the Appropriate Use Criteria by national cardiovascular societies (5), there exists a standardized approach to systematically assess the clinical appropriateness of PCI. Recent studies applying these criteria have found that rates of inappropriate PCI in the United States range from 12% to 17% for stable patients without acute coronary syndromes, but these studies did not examine the patients or hospital characteristics associated with procedures categorized as inappropriate (6–9). Illuminating whether some of the observed differences in rates of PCI by race, sex, or insurance status of the patients may be due to PCIs considered by the Appropriate Use Criteria to be inappropriate, can provide information to improve equity in health care (10,11). This would suggest that efforts to reduce healthcare differences will not simply mean raising procedural rates for vulnerable populations, but also improving its use in whites, men, and privately insured patients. Thus, complex efforts would be required to address both procedural underuse and overuse.

To address this current gap in knowledge, we analyzed data from a large national PCI registry to examine whether certain patient demographics and insurance status are associated with inappropriate PCIs for nonacute indications. In addition, we examined whether certain hospital factors, such as location of hospital, hospital for-profit status, academic affiliation, and annual PCI volume, are associated with higher rates of inappropriate PCIs.

Methods

Data source. The CathPCI Registry is an initiative of the American College of Cardiology Foundation and The Society for Cardiovascular Angiography and Interventions. There are more than 1,500 participants submitting data from diagnostic cardiac catheterization and PCI procedures to the national registry. The design and salient characteristics of the registry have been previously described (12–14). Detailed information on patient characteristics, coronary angiography, PCIs, and in-hospital outcomes is collected by trained staff at participating hospitals using standardized data elements. For CathPCI Registry, all submissions of reported procedural data must meet predetermined levels of completeness and consistency for data fields and internal quality assurance protocols before the information is entered into the registry (14). In addition, the National Cardiovascular Data Registry has a robust data quality program that conducts annual audits of data variables at 25 randomly selected sites. In 2010, the CathPCI Registry found that the accuracy rate of audited sites was 93.1% (range, 89.4% minimum and 97.4% maximum) for 58 target variables (14).

Abbreviations and Acronyms

CI = confidence interval

OR = odds ratio

PCI = percutaneous coronary intervention

Appropriate use criteria. The methodology for developing the Appropriate Use Criteria for coronary revascularization that reflects a synthesis of contemporary clinical trial evidence, clinical practice guidelines, and expert opinion, has been previously described (5). Using a modified Delphi approach, a 17-member expert panel adjudicated the appropriateness of coronary revascularization compared with medical therapy for 198 distinct clinical indications. From the individual ratings of the technical panel members, each clinical indication was classified as appropriate, uncertain, or inappropriate. An "appropriate" rating denotes coronary revascularization, as compared with medical therapy, would likely improve a patient's health status (symptoms, function, or quality of life) or survival. An "uncertain" rating implies that more research and/or patient information is needed to further classify the indication. An "inappropriate" rating indicates that the benefits of coronary revascularization, compared with medical therapy, may not outweigh the risks of treatment (5). Each of these ratings were intended to evaluate care of populations of patients with the understanding that any single patient case may have unmeasured variables affecting clinical decision making. For this study, we focused on the appropriateness of coronary revascularization with PCI, as the CathPCI Registry does not collect information on coronary artery bypass surgery.

In our prior work, we developed algorithms for matching PCI procedures from the CathPCI Registry to appropriateness ratings from the Appropriate Use Criteria for coronary revascularization (6). Although the Appropriate Use Criteria have recently been updated, we used the original criteria from 2009 (5) because these were operative at the time that the majority of cases from this study were conducted, and also because this approach is consistent with the methodology we used in our original work (6).

Study population of stable ischemic heart disease patients undergoing PCI. We examined 1,087,995 PCI procedures between July 1, 2009 and March 31, 2011. Our prior work had demonstrated that the vast majority of PCIs that were rated inappropriate were performed for nonacute indications. Based on that work, we excluded acute PCIs (i.e., those performed for myocardial infarction and high-risk unstable angina) and restricted our study cohort to the 426,880 patients who underwent a nonacute PCI during this

Download English Version:

https://daneshyari.com/en/article/2945181

Download Persian Version:

https://daneshyari.com/article/2945181

Daneshyari.com