



# Trends in Use of High-Intensity Statin Therapy After Myocardial Infarction, 2011 to 2014

Robert S. Rosenson, MD,<sup>a</sup> Michael E. Farkouh, MD,<sup>b</sup> Matthew Mefford, MS,<sup>c</sup> Vera Bittner, MD,<sup>d</sup> Todd M. Brown, MD, MSPH,<sup>d</sup> Ben Taylor, PhD,<sup>e</sup> Keri L. Monda, PhD,<sup>e</sup> Hong Zhao, MSPH,<sup>c</sup> Yuling Dai, MSPH,<sup>c</sup> Paul Muntner, PhD<sup>c</sup>

## ABSTRACT

**BACKGROUND** Data prior to 2011 suggest that a low percentage of patients hospitalized for acute coronary syndromes filled high-intensity statin prescriptions upon discharge. Black-box warnings, generic availability of atorvastatin, and updated guidelines may have resulted in a change in high-intensity statin use.

**OBJECTIVES** The aim of this study was to examine trends and predictors of high-intensity statin use following hospital discharge for myocardial infarction (MI) between 2011 and 2014.

**METHODS** Secular trends in high-intensity statin use following hospital discharge for MI were analyzed among patients 19 to 64 years of age with commercial health insurance in the MarketScan database (n = 42,893) and 66 to 75 years of age with U.S. government health insurance through Medicare (n = 75,096). Patients filling statin prescriptions within 30 days of discharge were included. High-intensity statins included atorvastatin 40 or 80 mg and rosuvastatin 20 or 40 mg.

**RESULTS** The percentage of beneficiaries whose first statin prescriptions filled following hospital discharge for MI were for high-intensity doses increased from 33.5% in January through March 2011 to 71.7% in October through November 2014 in MarketScan and from 24.8% to 57.5% in Medicare. Increases in high-intensity statin use following hospital discharge occurred over this period among patients initiating treatment (30.6% to 72.0% in MarketScan and 21.1% to 58.8% in Medicare) and those taking low- or moderate-intensity statins prior to hospitalization (from 27.8% to 62.3% in MarketScan and from 12.6% to 45.1% in Medicare). In 2014, factors associated with filling high-intensity statin prescriptions included male sex, filling beta-blocker and antiplatelet agent prescriptions, and attending cardiac rehabilitation within 30 days following discharge.

**CONCLUSIONS** The use of high-intensity statins following hospitalization for MI increased progressively from 2011 through 2014. (J Am Coll Cardiol 2017;69:2696-706) © 2017 by the American College of Cardiology Foundation.

Several randomized controlled trials have shown high-intensity statin therapy to be more efficacious than lower intensity therapy for preventing recurrent atherosclerotic cardiovascular disease (CVD) events among patients hospitalized for acute coronary syndrome (ACS) (1-3). Analyses of registries and insurance claims databases have documented that between 20% and 40% of patients with ACS fill



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From <sup>a</sup>Mount Sinai Heart, Icahn School of Medicine at Mount Sinai, New York, New York; <sup>b</sup>Peter Munk Cardiac Centre and Heart and Stroke Richard Lewar Centre, University of Toronto, Toronto, Ontario, Canada; <sup>c</sup>Department of Epidemiology University of Alabama at Birmingham, Birmingham, Alabama; <sup>d</sup>Department of Medicine, Division of Cardiovascular Disease, University of Alabama at Birmingham, Birmingham, Alabama; and the <sup>e</sup>Center for Observational Research, Amgen, Thousand Oaks, California. The present study was funded by an industry-academic collaboration between Amgen, the University of Alabama at Birmingham, and the Icahn School of Medicine at Mount Sinai. Dr. Rosenson has received grant support from Akcea, Amgen, AstraZeneca, Eli Lilly, Esperion, The Medicines Company, and Sanofi; serves on advisory boards for Amgen, Eli Lilly, Regeneron, and Sanofi; and has received honoraria from Akcea and Kowa; and has received royalties from UpToDate. Dr. Farkouh has received grant support from Amgen. Dr. Bittner has received grant support from Amgen, AstraZeneca, DalCor, Sanofi-Regeneron, Pfizer, and Bayer Healthcare; and has served on advisory boards for Amgen and Eli Lilly. Dr. Brown has received grant support from Amgen and AstraZeneca. Dr. Taylor is employed by Amgen. Dr. Monda is employed by and holds stock in Amgen. Dr. Muntner has received grant support from Amgen; and honoraria from Amgen. Freny Vaghaiwalla Mody, MD, served as Guest Editor for this paper.

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prescriptions for high-intensity statins following hospital discharge (4,5). However, these studies were conducted among patients having coronary heart disease (CHD) events through 2011, with few more contemporary data being published.

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Several events have occurred over the past several years that may have changed the use of high-intensity statins among patients with ACS. In 2011, the American Heart Association (AHA)/American College of Cardiology Foundation secondary prevention guidelines recommended “adequate” doses of statin therapy necessary to achieve specific low-density lipoprotein cholesterol thresholds (6). Although no specific statin intensity was recommended for patients with ACS, this guideline stated that it was reasonable (Class IIa, Level of Evidence: C) to treat patients who were at very high risk, including those with ACS, to an low-density lipoprotein cholesterol level <70 mg/dl. In 2013, the American College of Cardiology (ACC)/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic CVD risk in adults was published and recommended the use of high-intensity statin therapy for patients with established CVD (1). Other considerations that may have influenced prescribing patterns beginning in 2011 include a black-box warning against new prescriptions for simvastatin 80 mg and the generic availability of atorvastatin.

We evaluated secular trends in high-intensity statin use following hospitalization for myocardial infarction (MI) from 2011 through 2014 in 2 large samples of U.S. adults. Also, we identified patient characteristics for those who initiated statins with a high- versus a low- or moderate-intensity dose following their MIs and those who were titrated from low or moderate statin intensity to a high-intensity statin after their MIs in 2014. The results of this study provide contemporary data on the use of high-intensity statins following publication of the most recent ACC/AHA cholesterol guidelines, characterize patients who do versus do not receive high-intensity statins following hospital discharge for MI, and thereby identify those with an unmet treatment need.

## METHODS

We conducted a retrospective cohort study using administrative claims from MarketScan and Medicare. The MarketScan database contains health care claims for persons with commercial, Medicare supplemental, and Medicaid health insurance and was

obtained through the Truven Health MarketScan Research Database. Medicare is a government program that provides health insurance for U.S. adults  $\geq 65$  years of age and younger adults with end-stage renal disease or who are disabled. Administrative claims for Medicare beneficiaries were obtained from the Chronic Conditions Warehouse, which was created by the Centers for Medicare and Medicaid Services to provide data for research purposes. The Institutional Review Board at the University of Alabama at Birmingham approved this analysis of deidentified data.

We studied MarketScan and Medicare beneficiaries who were hospitalized with overnight stays for MI between January 1, 2011, and November 30, 2014 (Online Figures 1 and 2). We restricted the analyses to patients whose hospital stays for their index MIs were  $\leq 30$  days, who were alive 30 days following hospital discharge, who had continuous MarketScan or Medicare fee-for-service insurance, and who were living in the United States from 365 days prior to hospital admission for their MIs through 30 days following discharge. Medicare fee-for-service coverage includes Parts A (inpatient), B (outpatient), and D (prescription). Beneficiaries enrolled in Medicare Advantage plans (Medicare Part C) were excluded, because complete claims are not available for these persons. We excluded MarketScan and Medicare beneficiaries with stays at skilled nursing facilities or hospice facilities within 30 days following their index MIs or with outpatient statin fills during their MI hospitalizations. To avoid overlap between the 2 samples, we restricted the MarketScan analysis to beneficiaries <65 years of age and Medicare analyses to beneficiaries 66 to 75 years of age at the time of hospital admission for MI. An age  $\geq 66$  years was used, rather than  $\geq 65$  years, to allow a 1-year look-back period to identify characteristics of Medicare beneficiaries. We analyzed Medicare beneficiaries >75 years of age separately because there are only limited data supporting high-intensity statins for this group. We restricted these analyses to beneficiaries who filled statin prescriptions within 30 days following hospital discharge for MI. The first MI each beneficiary experienced that met these criteria was included and is referred to as the index MI.

**STATIN USE.** Statin use was identified by pharmacy prescription fills in MarketScan claims and Medicare Part D pharmacy claims in combination with national drug codes. Statins included atorvastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, rosuvastatin,

## ABBREVIATIONS AND ACRONYMS

- ACC** = American College of Cardiology
- ACS** = acute coronary syndrome
- AHA** = American Heart Association
- CHD** = coronary heart disease
- CVD** = cardiovascular disease
- MI** = myocardial infarction

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