Heart & Lung xxx (2017) 1–6

Contents lists available at ScienceDirect

Heart & Lung

journal homepage: www.heartandlung.org

Healthcare provider compliance with the 2013 ACC/AHA Adult Cholesterol Guideline recommendation for high-intensity dose statins for patients with coronary artery disease

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ARTICLE INFO

Article history:
Received 4 February 2017
Received in revised form
7 March 2017
Accepted 10 March 2017
Available online xxx

Keywords:
Atherosclerotic cardiovascular disease
Healthcare provider compliance
Statins
Cholesterol guidelines
Quality improvement

ABSTRACT

Background: Atherosclerotic cardiovascular disease is the foremost cause of death for U.S. adults. The 2013 ACC/AHA Adult Cholesterol Guidelines recommend high-intensity dose statins for individuals with coronary artery disease (CAD).
Objective: To determine healthcare provider compliance with the Cholesterol Guideline recommendation specific to high-intensity dose statins for patients with CAD.
Methods: A retrospective chart review was conducted to determine compliance rate. A questionnaire was developed to evaluate healthcare provider beliefs, attitudes, and self-confidence toward this recommendation.
Results: Of the 473 patients with CAD, 67% were prescribed a high-intensity dose statin. Patients with non-ST segment myocardial infarction and ST segment myocardial infarction were more likely to be prescribed a high-intensity dose statin versus a moderate or low-intensity dose. Healthcare providers strongly agreed with this guideline recommendation.
Conclusion: There exists a dichotomy between intention to prescribe and actual prescribing behaviors of high-intensity dose statin for patients with CAD.

Introduction

Atherosclerotic cardiovascular disease (ASCVD) is the foremost cause of death for adult men and women in the United States.[1] In 2011, the direct and indirect costs associated with cardiovascular disease and stroke were estimated to be over 316 billion dollars.[2] Individuals with known ASCVD are at high risk for fatal and non-fatal cardiovascular events.[1,3] High-intensity dose statins, compared to low or moderate-intensity dose, have shown superiority in reducing secondary events in patients with ASCVD.[4] In 2013, the American College of Cardiology (ACC) and the American Heart Association (AHA) announced new guidelines for the treatment of blood cholesterol to reduce ASCVD risk in adults.[1] These guidelines represents a shift in lipid management targeting treatment to ASCVD risk level rather than a LDL-C target and has been reported as a source of debate among healthcare providers.[1,5]

The United States Department of Health and Human Services cholesterol expert panel synthesized the evidence from multiple randomized controlled trials on statin therapy to develop the recommendations for the 2013 ACC/AHA Adult Cholesterol Guidelines.[6–10] Studies have demonstrated that high-intensity dose statins significantly reduce secondary cardiovascular events and reduce mortality following acute myocardial infarction.[4,6–8] High-intensity dose statins have been shown to reduce LDL-C by at least 50%, and more effectively stabilized coronary plaque at 12 months post-acute coronary event, in comparison to moderate or low-intensity dose statins.[1,11] A significantly higher risk of secondary cardiovascular events exists among ASCVD patients in whom LDL-C reduction was <50% from baseline despite achievement of the targeted LDL-C level.[12] Studies have shown that index

Conflicts of interest: None.

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http://dx.doi.org/10.1016/j.hrtlng.2017.03.005

and subsequent cardiovascular events represent a significant economic burden to patients and adds to healthcare costs in the United States.[13–15] High-intensity dose statins have been shown to reduce the need for revascularization by 14%, thus reducing the overall cost of care associated with secondary cardiovascular events.[7,16]

Several studies have investigated healthcare provider compliance to guidelines established by the National Cholesterol Education Program Adult Treatment Panel III (ATP III), and have demonstrated variable compliance rates.[17–22] Healthcare provider compliance to ATP III averaged 77% for high-intensity dose statins among patients with coronary artery disease (CAD) for whom the LDL-C target was 100 mg/dL however, compliance significantly declined to 44% when the LDL-C target was revised to less than 70 mg/dL. Less than 40% of patients discharged with an acute coronary syndrome (ACS) were prescribed a high-intensity dose statin, while 28–33% did not receive any form of statin therapy.[17–19,22] Physician barriers to compliance with cholesterol guidelines included lack of guideline knowledge, misunderstanding of or disagreement with treatment goals, and patient or provider treatment preferences.[19–21,23–25]

The measurement of healthcare quality is determined by comparing performance measures to established benchmarks between similar organizations.[26] In 2015 the ACC/AHA published a focused update of secondary prevention lipid performance measures designed to address adults 18–75 years with clinical ASCVD. This new measure will allow for performance credit when offering either a moderate or high-intensity dose statin.[27] There is no measure that addresses high-intensity dose statin alone. The aim of this study was to evaluate healthcare provider compliance with the 2013 ACC/AHA Adult Cholesterol Guideline recommendation specific for a high-intensity dose statin to patients with angiographic evidence of CAD, and to assess their attitudes, beliefs, perceived social pressure, and self-confidence related to this prescribing behavior.

Methods

This study was a retrospective chart review performed at a large, Midwestern United States University-based healthcare system. The study was approved by the Institutional Review Board and was conducted in the general cardiology clinic. The electronic medical record was queried to identify unique patients with CAD who had a minimum of one clinic encounter with a general cardiologist or cardiology nurse practitioner during 2015. Choosing a 99% confidence interval, 0.5 standard deviation, and margin of error of ±5%, the calculated needed sample size to assure descriptive accuracy was 473. Subject records were randomly selected and assessed for eligibility until the needed sample size was reached. Inclusion criteria included angiographic evidence of CAD, age 21–75 years, and confirmation of care received during 2015. The calendar year 2015 was selected as the researchers assumed cardiology providers would be aware of and follow the recommendation for high-intensity dose statins in CAD patients given that the new guidelines were available in 2013. Angiographic evidence of CAD was desired to secure a homogeneous cohort. Exclusion criteria included error in CAD diagnosis, normal coronary arteries on angiography, intolerance or allergy to statins, patient refusal to take a statin, or care provided by a non-cardiologist or non-cardiology nurse practitioner. The principal investigator was responsible for the review of all electronic medical records. Data collected included patient age, gender, race, use of statin agent, use of non-statin agents, comorbid conditions, and coronary angiogram data. High, moderate, and low-intensity dose statins were defined per the 2013 ACC/AHA Adult Cholesterol Guidelines (Table 1).[1] Obstructive CAD was defined as a coronary stenosis equal to or greater than 50%. Chronic kidney disease was defined as an estimated glomerular filtration rate less than 60 ml/min. Non-statin therapy included nicotinic acid derivatives, fibric acid derivatives, bile acid sequestrants, and/or cholesterol absorption inhibitors. Healthcare provider compliance was met if an order for a high-intensity dose statin was found in the electronic medical record. An email correspondence was sent to all general cardiologists and cardiology nurse practitioners ($n = 50$) introducing the study and inviting them to complete the 5-item survey designed by the investigators to assess attitudes, beliefs, perceived social pressure, and self-confidence related to prescribing high-intensity dose statins for ASCVD secondary prevention.

Table 1
Statin dose intensity.

Statin	High-intensity	Moderate-intensity	Low-intensity
Atorvastatin	40–80 mg	10–20 mg	
Rosuvastatin	20–40 mg	5–10 mg	
Simvastatin		20–40 mg	10 mg
Pravastatin		40–80 mg	10–20 mg
Lovastatin		40 mg	20 mg
Fluvastatin		40 mg twice daily	20–40 mg
Fluvastatin XL		80 mg	
Pitavastatin		2–4 mg	1 mg

Note: Adapted from the ACC/AHA 2013 Adult Cholesterol Guideline.[1]

The theory of planned behavior served as the theoretical foundation for this study.[28] According to Fishbein and Ajzen, the intention to perform a behavior is the best indicator that the desired behavior will occur.[28] Theoretical constructs that may influence intention to perform a behavior include; individual beliefs, attitudes, perceived social pressure, and level of self-confidence.[28] For example, if a healthcare provider does not believe that a high-intensity dose statin will improve patient outcomes, they may choose to prescribe a lower intensity dose. Conversely, if a healthcare provider feels social pressure from their colleagues to prescribe a high-intensity dose statin to patients with CAD, they may be more inclined to do so. Utilization of this theory provides a framework for development of survey questions to better understand predictors of intention to prescribe a high-intensity dose statin to patients with CAD. The survey items were developed to align with four select constructs of the theory of planned behavior which are outlined in Table 2.

Table 2
Survey items.

Questions
1. Providing a high-intensity dose statin to patients 21–75 years with documented CAD will lower cardiovascular event rates? (Constructs: attitude, beliefs)
1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
2. Colleagues whose opinion I value and respect believe that it is appropriate to prescribe a high-intensity dose statin to patients 21–75 years with CAD? (Constructs: attitude, beliefs)
1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
3. I agree with the 2013 ACC/AHA Adult Cholesterol Guideline to prescribe a high-intensity dose statin to patients with CAD who are without contraindications (allergy, intolerance, liver dysfunction, etc.)? (Construct: Beliefs)
1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
4. I will recommend a high-intensity dose statin to all patients 21–75 years with documented CAD who are without contraindications (allergy, intolerance, liver dysfunction, etc.)? (Construct: Self-confidence)
1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree
5. I am influenced by my colleagues to recommend a high-intensity dose statin to patients 21–75 years with CAD. (Construct: Social pressure)
1 = strongly agree 2 = agree 3 = undecided 4 = disagree 5 = strongly disagree

ACC = American College of Cardiology; AHA = American Heart Association; CAD = coronary artery disease.