Original Contribution

Clinical implications of the American College of Cardiology/American Heart Association guidelines for the treatment of blood cholesterol for a rural community: Data from the Heart of New Ulm Project

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BACKGROUND: The 2013 American College of Cardiology (ACC)/AHA cholesterol guidelines represented a significant paradigm shift in the approach to the treatment of cholesterol in the United States.

OBJECTIVE: To assess prevalence of indications for statin therapy according to the ACC/AHA cholesterol guidelines in a rural community.

METHODS: A cross-sectional analysis was performed using data from the Heart of New Ulm Project, a population-based intervention aimed at reducing modifiable Adult Treatment Panel (ATP) III guidelines for the treatment of cholesterol for cardiovascular disease (ASCVD) risk factors in New Ulm, MN. Indications for statin therapy according to the ACC/AHA guidelines were determined using electronic health record data for area residents aged 40 to 79 years with visits in 2012 to 2013. There were 7855 adults aged 40 to 79 years in the target population, of which 4350 (55.4%) had a clinic visit with a fasting lipid panel.

RESULTS: In our study sample (mean age 59.6 [10.4] years, 53.0% female), 2606 (59.9%) met one of the 4 major indications for statin therapy (19.2% clinical ASCVD, 15.5% diabetes, 1.1% low-density lipoprotein cholesterol ≥ 190 mg/dL, and 24.0% ≥ 7.5% 10-year ASCVD risk). Of those with an indication, 63.3% were on a statin (10.9% on a high-intensity statin). Of the 1375 patients (31.6%) who were not statin eligible (10-year ASCVD risk <5%), 29.5% were on a statin.

CONCLUSIONS: In a community sample of individuals using health care, 60% were statin eligible according to ACC/AHA guidelines and two-thirds of these patients were prescribed a statin. In

addition, almost 30% of those ineligible were taking a statin, suggesting the guidelines may provide an opportunity to decrease statin use in those at low ASCVD risk.

Introduction

The Adult Treatment Panel (ATP) III guidelines for the treatment of cholesterol for cardiovascular disease (ASCVD) prevention were primarily target-based, with treatment decisions largely based on the observed levels of low-density lipoprotein (LDL) cholesterol.[1] Many experts feel the evidence supports that allocation of statins should be based on ASCVD risk,[2–4] and the recent 2013 American College of Cardiology (ACC)/American Heart Association (AHA) guidelines for the treatment of blood cholesterol have now adopted such an approach.[5] A recent analysis of US National Health and Nutrition Examination Survey (NHANES) data estimated that implementation of the ACC/AHA guidelines would substantially increase statin eligibility, with an additional 12 million Americans aged 40 to 75 years now recommended to have a risk-based discussion with their provider and consider initiating statin therapy.[6] However, there has been little focus on the potential for the ACC/AHA guidelines to decrease statin use in individuals at low ASCVD risk, who are less likely to benefit from lipid-lowering therapy.

Statin initiation can only occur if patients have access to and use health care. The widespread adoption of electronic health records (EHRs) provides a unique opportunity to estimate the population-level impact of the ACC/AHA guidelines by assessing statin eligibility and use. The aim of this study was to assess the prevalence of indications for statin therapy according to the new guidelines and contemporary usage of statins and other lipid-lowering medications in a community setting using EHR data from the Heart of New Ulm (HONU) Project. Findings from this study will illustrate current cholesterol treatment levels and assess the potential impact of the new cholesterol guidelines on the US population.

Methods

Setting and study sample

The HONU project is a 10-year population-based study aimed at reducing modifiable ASCVD risk factors through interventions in the community, worksites, and health care system in the rural community of New Ulm, Minnesota.[7,8] New Ulm is located about 100 miles southwest of the Minneapolis—St. Paul metropolitan area, in an agricultural region of the state. The target population is defined as those aged 40 to 79 years, residing in the 56,073 zip code, which includes the city of New Ulm. The HONU project was approved by the Allina Institutional Review Board and the board determined that use of a deidentified data set was allowed for this project. Data were limited to patients who provided consent for use of their individual EHR data for research purposes.

The HONU target zip code has 13,290 adult residents (2010 US Census) and 7855 in the 40- to 79-year age group. Health care in this community is provided by one health care system (Allina Health) that operates the New Ulm Medical Center, the only clinic and hospital located in the community, enabling use of the EHR to assess population-level risk factors.[9,10] There were 6323 residents aged 40 to 79 years (81% of eligible population) with an ambulatory clinic visit with either a physician or a nurse during the study period (January 1, 2012–December 31, 2013), of which 4350 (55%) had adequate ASCVD risk factor data, including a fasting lipid panel, during the study timeframe. Of the 1973 excluded due to missing data, the vast majority (95%) were excluded due to lack of a lipid panel.

Individual risk factor and demographic measures

Serum levels of total cholesterol, high-density lipoprotein (HDL) cholesterol, and LDL cholesterol, blood pressure, weight, and smoking status were extracted out of the EHR using the last measures available during the study period. Measures of height, ethnicity, and gender were the most recent available. Age was defined as age at the start of the study time period (January 1, 2012). Body mass index was calculated as weight in kilograms divided by height in meters squared. A person was defined as having ASCVD, coronary heart disease (CHD), diabetes, or chronic kidney disease if they had any visits (ambulatory, inpatient, or emergency department) in the EHR during or before the study period with diagnosis codes (International Statistical Classification of Disease and Related Health Problems-9) that fit within the definition of those conditions (diabetes excludes gestational).

Lipid-lowering medications

The use of lipid-lowering medications was defined as having a medication order (indicating a prescription) within a lipid-lowering medication category in the EHR from a nonhospital visit with a start date before the end of the study period (and no end date before the start of the study