Treatment Trends, Effectiveness, and Safety of Statins on Lipid Goal Attainment in Chinese Percutaneous Coronary Intervention Patients: a Multicenter, Retrospective Cohort Study

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ABSTRACT

Purpose: Limited data exist on the use of statins in Chinese patients with coronary artery disease (CAD) treated with percutaneous coronary intervention (PCI). We therefore conducted this study to observe the usage trend and the effectiveness of statins on LDL-C goal attainment and other lipid parameters among PCI-treated patients.

Methods: This multicenter, retrospective, observational, longitudinal cohort study was conducted in PCI-treated patients with CAD between July 1, 2011, and February 28, 2015. Primary study outcomes included statin treatment pattern after PCI and proportion of patients achieving target (LDL-C) levels 1 month after PCI and initiating statin therapy.

Findings: Data were analyzed for 2708 patients (mean age, 59 [10] years; median body mass index, 25.6 [4.0] kg/m^2). From baseline to the end of 1 month, atorvastatin and rosuvastatin were the most prescribed statins; 20 mg and 10 mg were the most prescribed doses and therefore chosen for efficacy comparisons. In patients without dose changes, LDL-C reduction with rosuvastatin 10 mg was significantly greater compared with atorvastatin 20 mg (–0.67 mmol/L [from 2.44 mmol/L to 1.77 mmol/L] vs –0.54 mmol/L [from 2.40 mmol/L to 1.86 mmol/L]; $P = 0.008$). However, there was no difference in HDL-C, triglyceride, or total cholesterol values between groups. Age and LDL-C levels at baseline were significantly associated with target LDL-C achievement.

Implications: In real-world, PCI-treated Chinese patients, atorvastatin and rosuvastatin were the most prescribed statins. Compared with atorvastatin 20 mg, rosuvastatin 10 mg was associated with greater LDL-C reductions and achievement of LDL-C targets in a higher percentage of patients. This analysis of real-world data shows that both rosuvastatin and atorvastatin were well tolerated and seemed to be suitable drugs for controlling lipid levels and preventing CVD risk in post-PCI Chinese patients with CAD. (*Clin Ther.* 2017;39:1827–1839) © 2017 Published by Elsevier HS Journals, Inc.

Key words: LDL-C, observational, percutaneous coronary intervention, retrospective, statins.

INTRODUCTION

Approximately 230 million people in China are affected by cardiovascular disease (CVD), of whom >6 million have coronary artery disease (CAD).[1] Report on Cardiovascular Disease in China, 2011,

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the mortality rate of patients with CAD in urban and rural settings was 91.41 and 51.89 per 100,000 patients, respectively, making up the majority of the total CVD-related deaths.[2] The overall high incidence and increasing mortality due to CVD require the implementation of effective measures to prevent the increase of coronary heart disease in China.

The Chinese guidelines for dyslipidemia management recommend statin therapy for lowering CVD risk in patients with elevated LDL-C levels.[3] In addition to promoting a healthy lifestyle and early modification of CVD risk (in which statin therapy constitutes a cornerstone), invasive therapy such as percutaneous coronary intervention (PCI) is recommended for treating significant CAD.[4] After its introduction in China during the 1980s, PCI's use has gradually increased for the management of CAD, mainly for patients with acute coronary syndrome (ACS). The procedure has attained an annual growth rate of 20% to 30% over the years,[1,5,6] and by 2011, >330,000 procedures had been performed in China.[1] Although revascularization procedures post-ACS reduce the CV risk, there is a substantial risk for recurrent cardiac events in both Chinese populations[7–10] and other PCI patient populations.[11–13] The identification and implementation of treatments that minimize risk of new ischemic events after PCI treatment is therefore warranted.

Previous literature has illustrated the importance of statin therapy in LDL-C control and lowering the incidence of adverse CV-related outcomes in Western patients with ACS.[14–16] There is also scientific support for early initiation of statin therapy in patients with coronary heart disease.[17–19] Similarly, the benefits of statins in terms of lowering the incidence of mortality and improving CV-related outcomes have been documented in Chinese patients[20–22] and other patients[23–25] with ACS and previous PCI treatment. Although the effects of statins have been evaluated in PCI-treated patients with ACS in a number of studies in China,[26,27] there are no real-world clinical studies showing the current situation of lipid management (in terms of LDL-C lowering and LDL-C goal achievement) post-implementation of the latest Chinese consensus on ACS.[28]

With an objective to elucidate real-world lipid management, we investigated the effectiveness and safety of statin therapy (primarily rosuvastatin and atorvastatin) in lowering LDL-C levels and attainment of lipid goals in Chinese patients with coronary heart disease undergoing PCI.

PATIENTS AND METHODS

Study Design and Participants

This multicenter, retrospective, cohort study was conducted between July 1, 2011, and February 28, 2015, to determine the effectiveness of statin treatment in terms of lowering lipid levels and attainment of lipid goals in patients who had previously undergone PCI or will undergo PCI. The study was divided into 3 periods: index date/baseline (defined as: initiation of statins for statin-naive patients before or after PCI; or date of PCI treatment for statin users, between July 1, 2011, and January 31, 2015); observation period (duration of capturing patient data, between August 1, 2011, and February 28, 2015); and follow-up for 1 month after baseline.

The study included patients aged ≥18 years at baseline; who had received statin therapy for 30 days during the period between July 1, 2011, and January 31, 2015; had undergone ≥1 month of follow-up after baseline, including continuous statin treatment, lipid profile, and laboratory values for safety profile; and had values available for a full lipid panel before or at baseline, and a full lipid panel at least 30 days after baseline. Patients were not considered eligible if they discontinued statin treatment before completing 30 days of statin treatment, were diagnosed with familial hypercholesterolemia, or had a malignant tumor at baseline.

The study protocol was approved by the institutional review boards of all the respective sites in accordance with the International Conference on Harmonisation guidelines for Good Clinical Practice (ICH-GCP E6, 1996) and the Declaration of Helsinki (1964). Informed consent from patients was waiver because this study was a retrospective analysis. However, data confidentiality was maintained, and patient privacy was protected throughout and after the study.

Study Outcomes

The primary outcome of the study was the percentage of PCI-treated patients achieving the LDL-C reduction goal (LDL-C <1.8 mmol/L or ≥50% reduction in LDL-C) after 30 days of statin treatment. As per the 2016 European guidelines for CVD prevention[29] and the 2011 American College of