March 2017

AJMC® SUPPLEMENT
THE AMERICAN JOURNAL OF MANAGED CARE®

Unmet Needs in Cardiovascular Risk Reduction

CARDIOVASCULAR DISEASE OVERVIEW

Cardiovascular disease (CVD) poses a substantial burden on global health as the leading cause of deaths worldwide, accounting for over 17.3 million per year.[1] Diseases and conditions affecting the heart and vascular system fall under the umbrella of CVD. This article focuses on the treatment of high-risk patients with such CVDs as coronary heart disease (CHD), cerebrovascular disease, and hypertensive heart disease.

Atherosclerosis is a causative factor in CHD, cerebrovascular disease, and aortic and arterial diseases, including hypertension and peripheral vascular disease (PVD).[1] CHD is the narrowing of the blood vessels that supply blood and oxygen to the heart, and this may lead to unstable angina, myocardial infarction (MI), and heart failure (HF). Cerebrovascular disease, or ischemic stroke, occurs as a result of atherosclerosis, where lipid deposits obstruct circulation to the brain. Hypertensive heart disease is specific to the blood vessels and may include aneurysm, high blood pressure, and peripheral arterial disease (PAD). PAD is characterized by vascular proliferation and remodeling of the small pulmonary arteries, where these changes may result in a progressive increase in pulmonary vascular resistance, ultimately leading to HF and premature death.

Most risk factors for CVD are manageable with lifestyle modifications and effective treatment; however, genetic risk factors have been identified that predispose patients to CVD. Behavioral risk factors for CVD include smoking, sedentary lifestyle, and unhealthy diet; metabolic risk factors include hypertension, diabetes, elevated body weight, and raised blood cholesterol.

Control of lipid levels is one of the most effective strategies for cardiovascular (CV) event prevention.[1] Low-density lipoprotein cholesterol (LDL-C) plays an important role in arterial plaque development and progression of atherosclerosis in the pathogenesis of CV events. Circulating LDL-C molecules penetrate the arterial wall endothelium and become oxidized to promote inflammation. In turn, this causes injury to the overlying endothelium and smooth muscle cells, which promotes deposition of cholesterol in the arterial wall.[2] Elevations in LDL-C levels directly link to progression from early stage fatty streaks to advanced-stage lipid-rich plaques. Over time, vessels stiffen and atherosclerotic plaques can rupture, triggering thrombus formation in 1 or more coronary arteries. The resulting decreased myocardial blood flow and cardiomyocyte necrosis lead to CHD, MI, and cardiac death. Thrombus development in the brain as a result of atherosclerosis leads to stroke and PVD.[1,3]

The results of many clinical trials have demonstrated the efficacy of statins at reducing circulating LDL-C levels, primarily to reduce major CV events and related deaths. The evidence from these trials has been useful in designing cholesterol-lowering treatment targets and guidelines that aim to prevent and manage CVD. However, several clinical trials indicate that a large proportion of patients, particularly those at high or very high CV risk, fail to achieve lipid goals. Despite statin efficacy in achieving LDL-C targets, addressing residual CV risk (incidence of CV events in patients receiving statin treatment) is of great importance for the development of novel therapeutics that will reduce CV events.

BURDEN OF CVD IN THE UNITED STATES

Since 1918, CVD has been responsible for more American deaths than any other major cause of death, exceeding the mortality rates of cancer and chronic lower respiratory disease combined.[4] In fact, deaths due to CVD substantially contributed to the total number of American deaths compared with the other top 10 leading causes of death: cancer (22.5%); chronic lower respiratory disease (5.6%); unintentional