The Efficacy and Safety of Statins in the Primary Prevention of Cardiovascular Disease

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Atherosclerotic plaques form in the blood vessels from particles of cholesterol. These plaques can lead to major cause of cardiovascular disease and have the ability to result in fatal cardiovascular events. In researching this topic, Published, the Cochrane Library, Dynamed, and ClinicalKey were all utilized in finding articles that were published from 2002 to 2018. There are several organizations with conflicting guidelines recommending the use of statins medications in the primary prevention of cardiovascular disease. The research evaluated: 


Crandall et al. (2017) assessed the incidence of diabetes in patients who were aged 40-70 years with a normal body mass index. In this population, 21.5% of the subjects were taking statin medications and an additional 15.8% of the subjects would be eligible for statin medications based on the ACC/AHA guidelines recommending statin therapy in those with diabetes and the USPSTF guidelines do not. Others who were covered under the ACC/AHA guidelines included younger smokers, younger males with dyslipidemia and younger women with single risk factors. The researchers concluded that statin use may be a risk factor for developing diabetes. 

All these studies have contributed to the debate on whether cardiovascular events are truly being prevented by the use of statin medications or if these medications are being over prescribed. The ACC/AHA guidelines have been criticized as it may seem like a risk patient, that the patient is monitored closely. In this paper, the researcher will evaluate the benefits of statin medications when they are being utilized for the primary prevention of cardiovascular disease.

Introduction

Atherosclerotic plaques form in the blood vessels from particles of cholesterol. These plaques can lead to major cause of cardiovascular disease (CVD) and have the ability to result in fatal cardiovascular events. In patients taking statins, does the benefit of taking statins outweigh the risk of taking a statin medication (rather than not taking a statin medication) prevent cardiovascular events as statins were first approved for use in 1987 (Baron, 2017). 

Data is inconclusive and differ among many studies whether the use of statins is beneficial in primary prevention when evaluating the rate of events, CVD mortality and all-cause mortality.

HMG-CoA reductase is an enzyme involved in the first step in the formation of cholesterol in the liver. By inhibiting HMG-CoA (the mechanism of statin medications), the synthesis of cholesterol is reduced, thereby reducing the rate of cholesterol formation. As we age, we will not know the exact cause of plaque formation or migration of plaques in cardiovascular events. There is also lack of information on whether statin medications have deleterious long-term effects as the widespread use of statins has been somewhat recent in terms of medical research as statins were first approved for use in 1987 (Baron, 2017).

Statement of the Problem

Statin medications have become a mainstay in the primary prevention of CVD. Controversy exists on whether cardiovascular events are truly being prevented by the use of statins or if these medications are being over prescribed.

Research Question

In patients without existing cardiovascular disease, does taking a statin medication (rather than not taking a statin medication) prevent cardiovascular events? In patients taking statins, does the benefit of taking statins outweigh the risk of long-term statin use in the primary prevention of cardiovascular disease?

Research Question

In patients without existing cardiovascular disease, does taking a statin medication (rather than not taking a statin medication) prevent cardiovascular events? In patients taking statins, does the benefit of taking statins outweigh the risk of long-term statin use in the primary prevention of cardiovascular disease?

Literature Review

DeFilippis, Young, and Blaha (2015) evaluated the AHA/ACC ASCVD risk score with 4 other risk scores calculators to compare their efficacies. In: the 42,677 patients evaluated, researchers discovered 4 out of the 5 risk stratification tools overestimated risk in men by 37% and 46% to 67% in 3 of the 5 tools in women. ASCVD events were better predicted in women than in men.

Pagdilao (2017) evaluated 3,416 subjects aged 40 to 75 years without prior CVD. In this population, 21.5% of the subjects were taking statin medications and an additional 15.8% of the subjects would be eligible based on the USPSTF guidelines compared to an additional 24% who would be eligible based on the ACC/AHA guidelines. Each of the discrepancies is due to the ACC/AHA guidelines recommending statin therapy in those with diabetes and the USPSTF guidelines do not. Others who were covered under the ACC/AHA guidelines included younger smokers, younger males with dyslipidemia and younger women with single risk factors.

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In patients without existing cardiovascular disease, does taking a statin medication (rather than not taking a statin medication) prevent cardiovascular events? In patients taking statins, does the benefit of taking statins outweigh the risk of long-term statin use in the primary prevention of cardiovascular disease?

Recommendation Guidelines

United States Preventive Task Force

• Age 40-70 and LDL cholesterol >190 mg/dL and Age ≥72 (grade B)
• Diabetes, Age 40-70 and LDL >100-189 mg/dL (grade A)
• No Diabetes, Age 40-75, LDL 70-100 mg/dL, and ASCVD Risk >7.5% (grade B)
• No Diabetes, Age 40-75, LDL 7.5-108.0 mg/dL, and ASCVD Risk 5% (grade C)

Applicability to Clinical Practice

• Providers can use this information to make decisions together with their patients on whether a statin prescription is needed.
• Long-term use of statins for more than 5 years of these medications, have yet to be evaluated and is also a consideration providers should take into account when discussing risks with their patients.
• As patients over the age with conditions such as diabetes at much younger ages, long-term use of statins will become more prevalent.
• Side effects should be frequently discussed and risks should be assessed with single risk factors may have the greatest effect in the risk versus benefit discussion when determining statin appropriateness in patient care.

With greatest benefit seen in patients with multiple risk factors, patients with single risk factors may have the greatest effect in the risk versus benefit discussion when determining statin appropriateness in patient care.

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