



# Comparison of the application of treatment Panel III and American College of Cardiology/American heart Association guidelines for blood cholesterol treatment in Saudi Arabia

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**Background:** One of the major risk factors for cardiovascular diseases is hyperlipidemia. The primary aim of this study was to estimate the proportion of individuals between 40–75 years old that would be eligible for statin therapy based on ACC/AHA guideline as compared to ATP-III guideline in a population of patients in Saudi Arabia. We also intended to extrapolate the results to the entire Saudi population, and estimate the cost implications of the ACC/AHA treatment guideline.

**Methods:** This study was a retrospective, observational study involving adult patients aged between 40-75 years old. The study was conducted at the primary health care clinics at King Abdul-Aziz Medical/Riyadh. The eligibility for statins use was assessed and compared for each patient based on both the recent 2013 ACC-AHA guideline and the 2002 ATP-III guideline. The cost implication of applying the ACC/AHA treatment guideline was estimated based on the average cost for 40 mg Atorvastatin in the Saudi Market.

**Results:** A total of 1005 patients were included in the study. Using the ATP-III guideline, there were 139 male (43.7%) and 279 female (40.6%) eligible to receive statin therapy. Based on the 2013 ACC/AHA guideline, treatment is recommended in 315 males (99.1%) and 564 females (82.1%). On the other hand, high-intensity statin was recommended in 302 male (95%) and 400 female (58.2%). Only 74 (10.5%) patients were prescribed high-intensity statin of the 702 eligible patients. Extrapolating the results to the entire Saudi population, 2.369 million additional patients

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would be eligible for statin therapy when applying the ACC/AHA guideline. Applying the new guideline would result in a cost increase of at least 4.318 billion SR per year.

**Conclusions:** The eligibility for statin therapy was much higher when applying the ACC/AHA guideline as compared to ATP-III guideline. Applying the recent ACC/AHA dyslipidemia guideline increased the number of patients eligible for statin therapy to approximately two folds. This would be associated with a substantial increase in cost and possibly side effects. The concerns surrounding the ACC/AHA guideline should be addressed at the national level.

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**Keywords:** Hyperlipidemia, Dyslipidemia, ATP-III guideline, ACC/AHA guideline, Comparison, Cardiovascular risk

## 1. Introduction

Cardiovascular diseases (CVD) are the most common cause of morbidity and mortality worldwide, including Saudi Arabia [1,2]. Screening, early detection, and treatment to prevent further complications are very important for patients who are at risk for CVD. The common approach for primary prevention of CVD is to identify high-risk patients and individualize their treatment using lifestyle intervention and pharmacological agents.

Until recently, hyperlipidemia was managed according to the Adult Treatment Panel III (ATP III) guideline, which was published in 2002 [3]. According to the ATP III guideline, patients with CVD or CVD risk equivalent and low-density lipoprotein (LDL) level 100 mg/dL or higher are eligible for statins therapy [3]. Moreover, primary prevention is also recommended based on the assessment of both LDL and the 10 years risk of coronary artery disease based on Framingham calculator. The ATP III guideline was widely accepted and implemented in clinical practice.

In 2013, the American College of Cardiology/American Heart Association (ACC/AHA) released a new guideline for managing blood cholesterol

and preventing atherosclerotic cardiovascular events in adults [4]. Although it has been several years since the introduction of the new guideline, many physicians are still reluctant to apply the new recommendations and still relying on the old guideline. In fact, The ACC/AHA guideline has been received with significant controversy [5]. For example, although the ATP III guideline was based on the 10-year risk of coronary heart disease (CHD) only [3], the ACC/AHA guideline extends to include all hard atherosclerotic cardiovascular disease (ASCVD), including CHD and stroke [4], using a new risk assessment calculator [6]. The use of the Pooled Cohort Equations for assessment of the 10-year risk for ASCVD is, perhaps, the most controversial aspect of the new guideline [7]. The equation overestimated risk by 75–150% according to one study [8]. The ACC/AHA guideline has also lowered the risk level for sustain eligibility from 20% CHD risk in the ATP III guideline to 7.5% ASCVD risk. Eliminating fixed LDL-C targets and proposing 50% or 30–50% LDL-C reductions according to ASCVD risk was another substantial change in the new guideline [8]. Many patients who were not eligible for treatment should now receive treatment based on the new recommendations. The potential implications of these changes in largely expanding the number of patients eligible for statin therapy have received much attention [8–11].

The primary aim of this study was to estimate the proportion of individuals 40–75 years of age who would be eligible for statin therapy based on the 2013 ACC/AHA guideline as compared to the 2002 ATP III guideline in a population of patients attending primary health care clinics in Saudi Arabia. We also intended to extrapolate the results to the entire Saudi population, estimate the cost implication of the ACC/AHA treatment guideline, and to assess physicians' adherence to the new guideline recommendations in Saudi

### Abbreviations

ATP III	Adult Treatment Panel III
CVD	Cardiovascular diseases
LDL	Low density lipoprotein
HDL	High density lipoprotein
ESC	The American College of Cardiology/American Heart Association
ACC/AHA	Atherosclerotic cardio vascular disease
CHD	Coronary heart disease
KAMC	King Abdul-Aziz Medical City
DM	Diabetes mellitus
TG	Triglyceride

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