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Original article

Cost-effectiveness of rosuvastatin 20 mg for the prevention of cardiovascular morbidity and mortality: a Swedish economic evaluation of the JUPITER trial

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Abstract

Objective:
This study estimated the long-term health outcomes, healthcare costs, and cost-effectiveness of rosuvastatin 20 mg therapy in primary prevention of major cardiovascular disease (CVD) in a Swedish population.

Methods:
Based on data from the JUPITER trial, long-term CVD outcomes with rosuvastatin vs no active treatment were estimated for patients with an elevated baseline CVD risk (Framingham CVD score >20%, sub-population of JUPITER population) and for a population similar to the total JUPITER population. Using a decision-analytic model, trial CVD event rates were combined with epidemiological and cost data specific for Sweden. First and subsequent CVD events and death were estimated over a lifetime perspective. The observed relative risk reduction was extrapolated beyond the trial duration. Incremental effectiveness was measured as life-years gained (LYG) and quality-adjusted life-years (QALYs) gained.

Results:
Treating 100,000 patients with rosuvastatin 20 mg was estimated to avoid 14,692 CVD events over the lifetime (8021 non-fatal MIs, 3228 non-fatal strokes, and 4924 CVD deaths) compared to placebo. This translated into an estimated gain of 42,122 QALYs and 36,865 total life years (LYG). Rosuvastatin was both more effective and less costly over a lifetime perspective, and rosuvastatin is subsequently a dominant alternative compared to no treatment in the assessed population. Using the overall JUPITER population, rosuvastatin was dominant for the lifetime horizon. In the sensitivity analysis, rosuvastatin was the dominant treatment strategy over a 20-year time horizon, and cost-effective with an incremental cost-effectiveness ratio (cost per QALY) of SEK 1783 over a 10-year time horizon.

Limitations:
Some model inputs were derived from literature or other data sources, but uncertainty was controlled by sensitivity analyses.

Conclusions:
Results indicate that rosuvastatin 20 mg treatment is a cost-effective option vs no-treatment in patients with Framingham CVD risk >20% in Sweden and might even be cost saving if taking a long-term perspective.

Introduction

Cardiovascular disease (CVD) is the largest cause of morbidity and a major cause of death, premature death, as well as of reduced quality-of-life in European countries[1,2]. The most common CVD conditions are coronary heart disease (CHD) and cerebrovascular disease (stroke), accounting for ~40% and 25% of CVD deaths, respectively[3]. In Sweden, the overall burden of disease is dominated by cardiovascular diseases, mental disorders, and malignant tumors, as reported in an analysis of the World Health Organization National Burden of Disease and Comparative Risk Assessment toolkit[4]. Among Swedish men, CVD ranks first in disease burden and is largely due to the years lost due to premature death. CVD was estimated to cost the EU 169 billion Euros annually, with direct healthcare costs accounting for 62% of costs[5]. In Sweden, the cost of CVD was estimated to be 4.9 billion Euros in 2003, with 2.8 billion Euros reflecting direct healthcare costs[5].

Prevention of CVD events, including myocardial infarction (MI), stroke, and CVD-related death, has been the goal of CVD treatment for decades. Current treatment guidelines, including the European guidelines on cardiovascular disease prevention in clinical practice, recommend statin therapy for patients with established vascular disease, diabetes, and hyperlipidemia[6,7]. The Joint Task Force of the European and Other Societies on Coronary Prevention recommend that a 10-year coronary heart disease risk (Framingham score) exceeding 20% justifies the use of statin therapy[8]. In the recent joint EAS/ESC guidelines for the management of dyslipidaemias even more options for statin treatment is opened.[9] A recent clinical trial, Justification for the Use of statins in Prevention: an Intervention Trial Evaluating Rosuvastatin (JUPITER), demonstrated that rosuvastatin 20 mg significantly reduced the incidence of major cardiovascular events and all-cause mortality among individuals without hyperlipidemia but with elevated high-sensitivity C-reactive protein (hsCRP) levels[10]. The reduction in CVD events and mortality were similar in all sub-groups.

The objective of this study was to estimate the long-term health outcomes, healthcare costs, and cost-effectiveness of rosuvastatin 20 mg therapy compared with placebo in the primary prevention of major CVD using the JUPITER trial results for various risk levels projected over a long-term time horizon. Cost-effectiveness was assessed for overall JUPITER trial results and for a sub-population of patients with a baseline CVD Framingham risk above 20%, the latter being consistent with the approved indication in the European Union.

Methods

Based on events observed in the JUPITER trial, a cost-effectiveness model (probabilistic Monte Carlo micro-simulation) was constructed to estimate long-term cost-effectiveness of treatment with rosuvastatin (20 mg daily) for the prevention of cardiovascular mortality and morbidity. The model was used to assess the cost-effectiveness of rosuvastatin vs no active treatment in a Swedish setting from a healthcare payer perspective based on Swedish unit cost and epidemiological data. The model has been described in detail elsewhere[11].

Model population

The primary analysis was based on patients with no history of cardiovascular disease, with normal LDL-C levels, and elevated hsCRP levels ($n = 17,802$). The base case model population included 60% men at a mean age of 66 years at entry and Framingham risk >20%. The cost-effectiveness of rosuvastatin 20 mg was also analyzed for the full JUPITER population (60% men, mean age 66 years)[10].

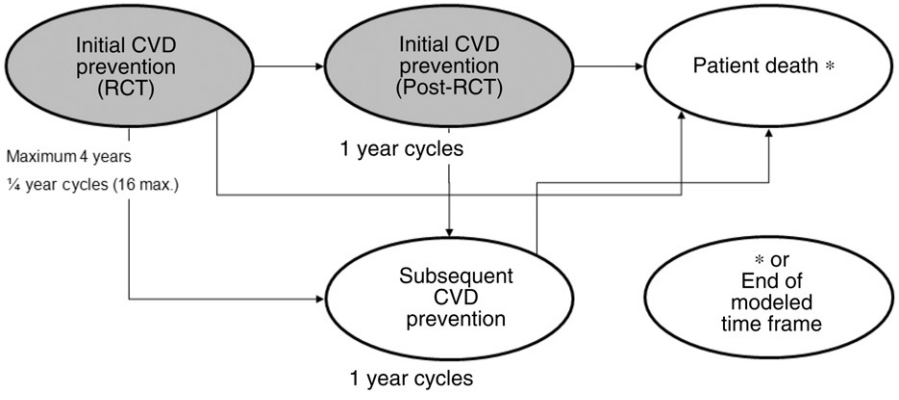

Figure 1. Model structure overview.

Model structure

An overview of the model structure is presented in Figure 1. The model consisted of three stages: (1) a stage corresponding to the JUPITER trial timeframe (4 years, CVD Prevention – RCT); (2) a stage simulating initial prevention beyond the trial time frame (initial CVD Prevention – Post RCT); and (3) a subsequent event prevention stage, applied after a patient has had an initial CVD event (subsequent CVD Prevention). The time period, cycle duration, and treatment discontinuation parameters for each model stage are described in Table 1. All patients in the cohort began in the CVD Prevention – RCT model stage and stayed for a maximum of 4 years. On a quarterly cycle basis, patients had a probability of experiencing an event; the event risk was estimated proportional to the risk observed in the JUPITER population. In the base case patients treated with rosuvastatin had a RR of 0.49 relative to the placebo group. Patients who do not experience events stay in the initial prevention stage until the next cycle of the model. Treatment effectiveness was modeled as reported in the JUPITER intent-to-treat data. Patients transition out of the CVD Prevention – RCT stage if they have not had an event by year 4 (transition to initial prevention post-RCT stage), they have a CVD event (transition to the subsequent prevention stage), or if they die (death stage). Non-fatal venous thromboembolism (VTE) may occur in all CVD prevention stages of the model, but does not force an exit from the CVD prevention stages as it is not considered to be a CVD event.

The initial CVD Prevention – Post-RCT stage of the model projected CVD prevention beyond the timeframe of the 4-year JUPITER trial (i.e., patient survival without a major CVD event). The Subsequent CVD Prevention stage of the model simulates patients who experience a non-fatal CVD event. Patients who received rosuvastatin 20 mg in the rosuvastatin arm continued on rosuvastatin 20 mg, while patients in the no treatment arm were assumed to initiate treatment with a 'representative' statin. The representative statin was defined as a Swedish market-share-weighted average of statins currently available in Sweden, as explained in detail in the discussion of treatment cost estimates below. This assumption reflects the European treatment guideline[7,8] recommendations to initiate patients on statins following a CVD event.

Data inputs

Clinical events

The model incorporated the primary end-points from the JUPITER trial, including: fatal and non-fatal MI, fatal and non-fatal stroke, coronary arterial revascularization (coronary artery bypass graft [CABG] or percutaneous transluminal coronary angioplasty/stent [PTCA]), unstable angina, and death from cardiovascular causes. Additionally, the model included non-CVD death and fatal and non-fatal VTE (both deep vein thrombosis [DVT] and pulmonary embolism [PE]).

For the CVD Prevention – RCT stage, quarterly probabilities of experiencing a first event were calculated by dividing the JUPITER trial adjudicated quarterly event counts by the number of patients at risk at the beginning of a quarter for the first 4 years of the model. Exponential survival curves provided the data to calculate a constant time-based probability of an event, as described in detail in Ohsfeldt *et al.*[11]. The treatment effect with rosuvastatin was constant over these quarterly time intervals (RR = 0.49). This approach was taken rather than using the JUPITER trial relative risk (RR) of 0.56, as the constant quarterly event probability calculation accounted for the shape of the curve (slope and height) which makes it a better estimate to carry forward over the long-term, and the high R^2 value of the fitted exponential curves provided justification to utilize constant treatment relative risk values of a CVD event both during the modeled RCT stage as well as into the post-RCT stage.

The distribution of events, given an event occurrence, was derived for each treatment arm from the JUPITER trial. Arterial revascularization was treated as a single event, assuming an 80/20% split between PTCA and CABG, based on the overall percentages of PTCA and

Table 1. Model specifications by stage of model.

	Initial CVD prevention RCT stage	Initial CVD prevention post-RCT stage	Subsequent CVD prevention stage
Time period in the stage	Maximum 4 years	4 years to lifetime or until first event occurs	Death or end of specified time period
Cycle length	Quarterly	1-year	1-year
Treatment discontinuation			
Treatment effect on event transition probability after therapy discontinuation	NA	Phased out over 5 years (20% per year)	Phase out over 5 years (20% per year)
Annual treatment discontinuation probability	6.94% per year for 4 years	5%	5%

CABG observed in the JUPITER trial data[12]. VTE events were modeled as a weighted combination of DVT and PE events. Non-CVD death rates were estimated using data from Statistics Sweden[13] and adjusted for deaths due to 'diseases of the heart' and 'cerebrovascular disease'[14].

The annual probabilities of an initial event were adjusted and carried forward from the CVD Prevention – RCT stage of the model to the Initial CVD Prevention – Post-RCT stage. The baseline probability was increased annually based on Framingham CHD 10-year risk age-adjustment calculations[15], resulting in an age-based risk increase of ~5% per year as the model default. The relative risks of an event with rosuvastatin treatment, distribution of events given an event, and the VTE event rates were all carried forward from the CVD Prevention – RCT stage.

There was no differentiation between previously-treated rosuvastatin and untreated patients in terms of CVD event relative risk in the Subsequent CVD Prevention stage.

Age-based CVD event rates for the Subsequent CVD Prevention stage as reported in the NICE HTA 2007 report[16] were used in the analysis.

Treatment continuation

During the CVD Prevention – RCT stage of the model, 100% of the patients in the treatment cohort were assumed to initiate treatment with rosuvastatin. The probability of a patient remaining on treatment declined linearly over the 4-year period to 75%, which corresponded to the discontinuation rate observed over the course of the JUPITER trial. Accordingly, treatment discontinuation did not affect treatment effectiveness during this stage of the model (as the impact of discontinuation is already reflected in the efficacy estimates from the clinical trial data).

For patients who discontinue treatment, the effect of treatment on event transition probabilities is phased out over 5 years, or 20% per year, as was seen in the long-term analysis of the West of Scotland Coronary Prevention (WOSCOP) trial[17].

During the Initial CVD Prevention – Post-RCT stage of the model, treatment-persistent patients were assumed to have a 5% annual discontinuation probability, based on studies of statin persistence under usual care[18]. For the Subsequent CVD Prevention stage of the model, 100% of the patients who experienced a non-fatal CVD event were assumed to initiate statin treatment (regardless of initial treatment assignment or past treatment discontinuation), but were assumed to discontinue statin therapy at a rate of 5% per year. The patient's treatment costs reflected the decreased drug utilization, and the treatment relative risk was phased back to unity (RR = 1.0) over a 5-year period for both the CVD Prevention – RCT and Subsequent CVD Prevention stages.

Costs

During the model simulation, costs, event counts, life years gained, and quality-adjusted life years gained were estimated at each stage of the model for each cohort of patients. Costs include treatment costs (drugs, initial physician visit, and monitoring tests) and event-related treatment costs (e.g., hospitalization and physician visits associated with CHD events).

Prescription drug cost estimates were based on list prices obtained from the TLV database[19] (Tandvårds och läkemedelsförmånsverket, TLV) as of December 2009; 12.69 SEK for rosuvastatin. However, it is well known that generic atorvastatin will be available in a few years and similarly generic rosuvastatin will be available some years later. The predicted future drug costs for rosuvastatin and atorvastatin post-generic availability were estimated by assuming a 95% price reduction after 1 year of generic availability. This is based on the Dental and Pharmaceutical Benefits Board estimated reduction in unit prices of generic drugs compared with the branded drug price, in the presence of competition among generic manufacturers[19]. However, to account for the uncertainty of the drug prices in the future and to understand the potential impact of this on study results, the cost-effectiveness results were also examined with current drug prices for different time horizons in the base case patient population. The generic costs of rosuvastatin and atorvastatin (included in the market basket statin class cost) were integrated in the analysis after 9 years for rosuvastatin and at the start of therapy for atorvastatin.

Treatment costs also included an additional physician visit and required safety monitoring tests, totaling 1790 SEK in connection with statin treatment, based on the tariff for a primary care visit in the southeast region of Sweden[20]. All costs related to drug treatment were assumed to end if drug therapy was discontinued.

The specific event cost estimates (direct medical costs) used in the model are summarized in Table 2 and were based upon published estimates from Swedish databases[21,22].

Utilities

All patients in the model had an age-dependent baseline health-related utility value[23]. Utility weights for each CVD event were based on estimates reported by Ward *et al.*[16] and Scuffham and Kosa[24], as noted in Table 2.

Table 2. Direct medical cost estimates and disutility for cardiovascular events.

	CVD event direct costs (2008 SEK)*		CVD event disutilities†	
	Event year	Subsequent years	Event year	Subsequent years
Non-fatal MI	164,296	43,782	0.24	0.24
PTCA	69,700	0	0.0175	0
CABG	167,000	0	0.037	0
Unstable angina	149,511	44,643	0.23	0
Non-fatal stroke	163,205	57,304	0.37	0.37
MI death	17,762	0	NA	NA
Stroke death	17,762	0	NA	NA
Other CVD death	17,762	0	NA	NA
Non-CVD death	11,750	0	0.5	1.0
Average CVD death (secondary CVD prevention)	17,762	0	0.5	1.0

*Source: KPP Database[21].
†Source: Table 61, Statins for the Prevention of Coronary Events, HTA report[12]; PTCA/CABG values per Scuffham and Kosa[25].

Multiplicative utility calculations were performed in the cases where multiple disutility values were applied (the assumed 'joint' utility value was the product of the individual utility values).

Discounting with half-cycle correction of life-years (LYs), QALYs, and costs was performed with 3% annual discount rates.

Analysis

In the model, two identical cohorts of patients were simulated on a patient-by-patient basis through the model with one cohort assigned to initial treatment with rosuvastatin 20 mg per day, and one cohort assigned to no active treatment (placebo). The cohorts were made identical using a pair-wise assignment of identical demographic and transition characteristics (i.e., event and treatment history).

Sensitivity analyses

One-way sensitivity analyses were conducted on rosuvastatin discontinuation (vary 0–50%), Subsequent Prevention statin initiation (60–100%), event costs (50–200%), event disutilities (50–150%), discounting (0–5%), event risk (50–150%), and event relative risk (50–150%). The range of values selected for these sensitivity analyses was intended to reflect the range of values potentially observed in usual practice. Probabilistic sensitivity analyses were performed for event costs, event disutilities, and relative risk of event. For costs, log-normal distributions were used with the mean parameter values as the default and the lower and upper range were set to 50% and 200% of the mean values. For disutility values, beta distributions were used and the minimum and maximum values were set to 50% and 150% of the mean values. Similarly, for relative risks, beta distributions were used as the confidence interval if the RR was below one (73% and 136% of the mean values based on the JUPITER trial 95% confidence interval).

Table 3. Base case (Framingham risk >20%) for predicted life years gained, therapy cost, impact on major cardiovascular events, and cost-effectiveness per 100,000 patients.

Total sample	Lifetime horizon post-therapy initiation		
	Placebo	Rosuvastatin	Difference
Total life years	1,304,320	1,341,185	36,865
Total quality-adjusted life years	982,048	1,024,170	42,122
Total direct costs (SEK 1000s)	168,490	146,313	−22,177
Cost per life year gained ICER			Dominant
Cost per quality-adjusted life years gained ICER			Dominant

ICER = incremental cost-effectiveness ratio.

Results

For a hypothetical cohort of 100,000 patients with a Framingham risk score >20%, the estimated incremental cost (present value) was a cost saving of 22,177 SEK per patient, with an estimated 36,865 life years gained and

42,122 QALYs gained, over a lifetime horizon (Table 3). Approximately 14,692 events were avoided over a lifetime horizon, with 8021 non-fatal MIs, 3228 non-fatal strokes, and 4924 CVD deaths avoided (Table 4). Rosuvastatin 20 mg daily treatment reduced cardiovascular morbidity and mortality and reduced costs compared with no treatment, and was thus a dominant treatment alternative (Table 3).

As a secondary analysis, the costs and benefits for a hypothetical model cohort of 100,000 patients representative of the JUPITER population (all risk levels) were also estimated. In this population rosuvastatin was a dominant alternative to placebo for the lifetime horizon. Estimated net cost savings were 5067 SEK per patient, with an estimated 25,252 life years gained and 28,314 QALYs gained. A total of 10,746 events were avoided among 100,000 patients over the lifetime.

Table 4. Base case (Framingham risk >20%) for cardiovascular events avoided per 100,000 patients.

Events avoided	Lifetime horizon post-therapy initiation
Total	14,692
Non-fatal MI	8021
Non-fatal stroke	3228
PTCA	1457
CABG	306
Unstable angina	954
CVD death	4924

Rosuvastatin remained dominant for the 20-year horizon, with estimated cost savings of 18,842 SEK per patient and 26,813 life years gained for the hypothetical cohort of 100,000 patients. An estimated 17,947 events were avoided in the 20 year horizon; 7609 non-fatal MIs, 3346 non-fatal strokes, and 4627 CVD deaths avoided. For a 10-year time horizon, the ICER was 1783 SEK per QALY gained, with an estimated incremental cost per patient of ~238 SEK and 8232 life years gained for the hypothetical cohort. Approximately 13,110 events were avoided in the 10-year horizon; 4549 non-fatal MIs, 2561 non-fatal strokes, and 2369 CVD deaths avoided.

Using current drug prices, not accounting for future generic pricing, rosuvastatin was dominant for the lifetime perspective and 20-year horizon and the ICER was 14,898 SEK for a 10-year time horizon.

Sensitivity analyses for the base case (Framingham risk >20%) population for the lifetime horizon were performed to examine the stability of the ICER estimates through a wide range of values for statin drug costs, event costs, event risk, relative risk, discontinuation, discounting, and disutilities. The results for the one-way sensitivity analysis for a lifetime horizon are illustrated in a tornado diagram (Figure 2). The model parameter with the most

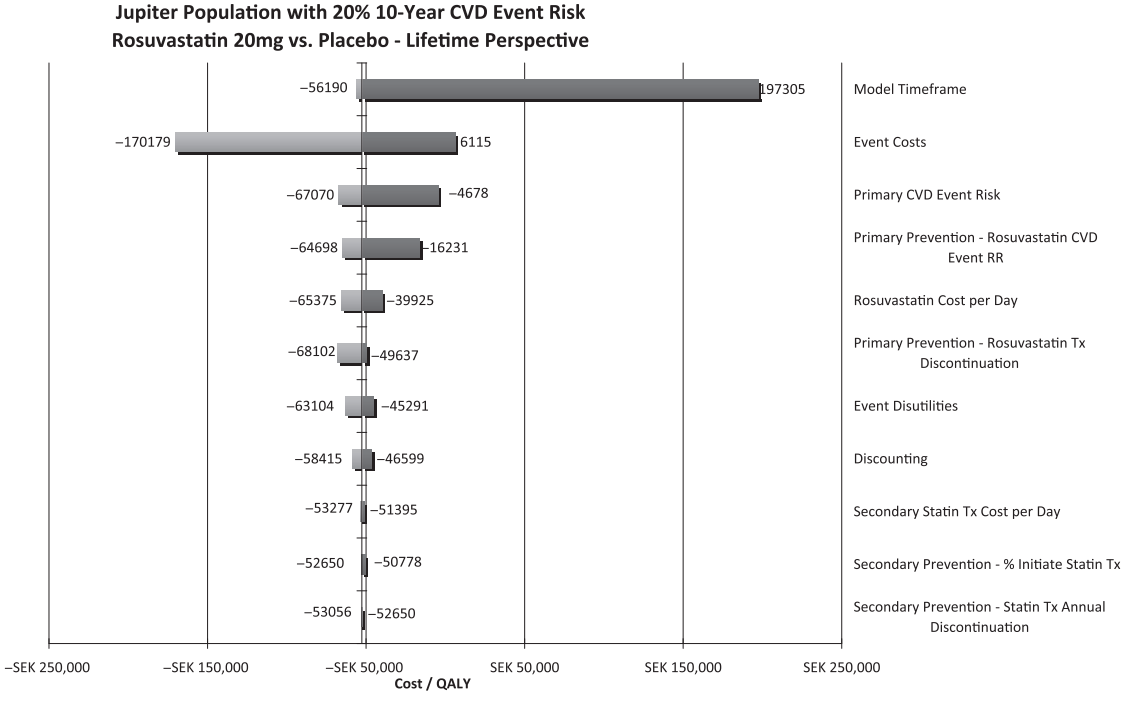

Figure 2. One-way sensitivity analyses, lifetime horizon for population with Framingham risk >20%. Costs are in SEK. Range of values were 50–200% for mean costs, 50–150% for mean disutility, 0–50% for rosuvastatin discontinuation, 60–100% for subsequent statin initiation, 0–5% for discounting, 50–150% for event risk and event relative risk.

substantial impact on estimated cost-effectiveness in addition to the model time horizon was the direct costs of treatment for CVD events. A doubling of the costs from the base-case assumption reduced the ICER so rosuvastatin was dominant, whereas reducing the costs by 50% increased the estimated ICER to 6115 SEK. Another key parameter was the CVD event risk for the treatment population. Doubling the assumed risk or reducing the risk by 50% from the base-case assumption showed that rosuvastatin was still dominant in both situations. The results were stable to a variation of the relative treatment effectiveness of rosuvastatin in the initial prevention stage. Assuming a 50% smaller or 50% greater CHD event risk reduction than in the base case indicated that rosuvastatin remained dominant. Changes in several model parameters relating to the Subsequent Prevention phase had little impact on the results in these one-way sensitivity analyses, including the assumed rate of statin treatment post-CHD event, the assumed rate of statin therapy discontinuation, and the cost per day of the 'market basket' statin therapy.

Probabilistic sensitivity analysis (PSA) was performed to evaluate the impact of simultaneous changes in multiple model parameters. The cost-effectiveness acceptability curve (Figure 3) indicates that at an acceptable willingness-to-pay threshold of 500,000–700,000 SEK per QALY gained, rosuvastatin therapy is considered cost-effective in 100% of the model replications. Even at a willingness to pay threshold value of 25,000 SEK/QALY, rosuvastatin would be considered cost-effective in 100% of model replications.

Discussion

Among high risk patients (Framingham score >20%), and patients similar to the JUPITER population, and based on generally accepted and observed willingness-to-pay threshold values used for cost-effectiveness analyses[25], rosuvastatin 20 mg daily was cost-effective in reducing cardiovascular morbidity and mortality in comparison with no active treatment in Sweden. Over a lifetime perspective, rosuvastatin provided better health outcomes at a lower cost and was therefore a dominating treatment strategy. For shorter time horizons the ICER was well below accepted threshold values for Sweden (500,000 SEK/QALY). Sensitivity analyses demonstrated that the results were robust to uncertainty in model parameters.

The results of the present study are similar to the findings of the Heart Protection Study[26] and other cost-effectiveness studies[27]. A cost-effectiveness analysis of the Heart Protection Study, a UK clinical trial of 40 mg simvastatin vs placebo in high CHD risk patients, found a cost per life year gained below $11,000 ($2500–$10,990) over a lifetime horizon[26], which is higher than the present study's lifetime cost per life year gained for the high risk and at-risk population. The Heart Protection Study cost analysis did not examine quality-adjusted life years. A similar study with US cost estimates and US life table figures using the same model as utilized in the present analysis showed that rosuvastatin therapy was cost-effective ($7062 ICER using cost per QALY over lifetime, $10,743 over a 20-year horizon, and $44,466 over a 10-year horizon) among at-risk patients (Framingham

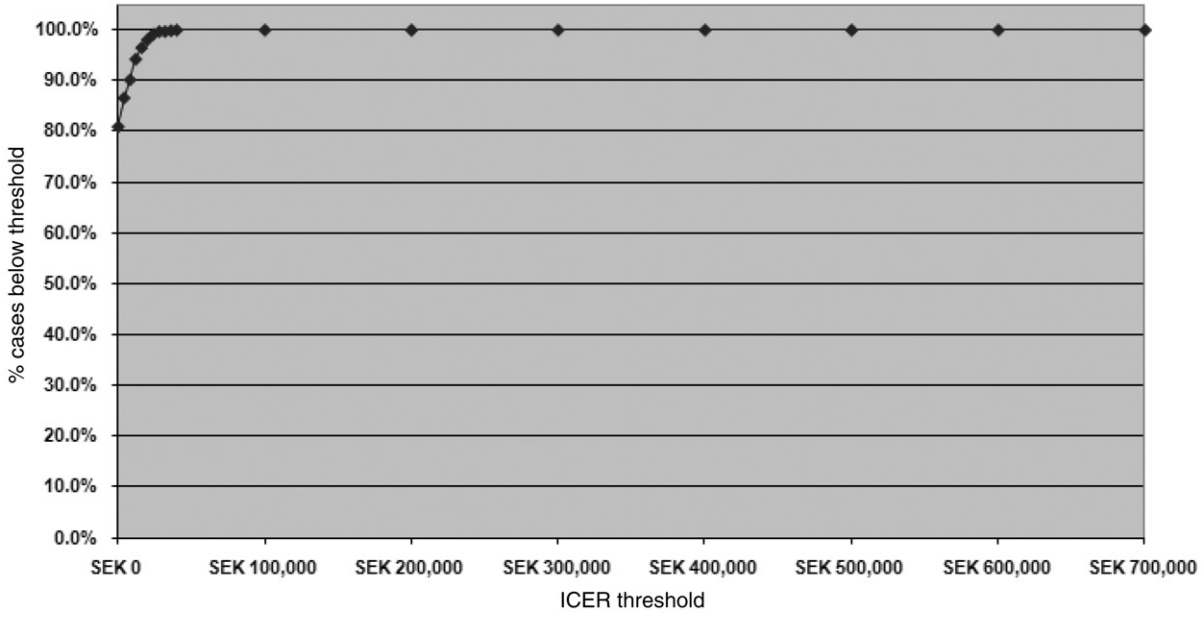

Figure 3. Cost effectiveness acceptability curve for cost per quality-adjusted life years gained over the lifetime horizon.

score ≥10%)[11], where the present study demonstrated cost savings and better effect for the lifetime and 20-year time horizons. The present study provides country-specific economic evaluation for decision-making within Sweden for the prevention of cardiovascular mortality and morbidity. Since health economic implications are unique to each country because of differences in treatment patterns, drug prices, and cost of care, Swedish costs, life tables for estimating CVD risk, and drug prices were used.

Both one-way and probabilistic sensitivity analyses indicated that the estimated costs per QALY gained were robust with respect to variation in most model parameters. In the one-way sensitivity analyses, even extreme parameter values yielded ICER estimates below most commonly accepted willingness to pay threshold values, and in fact showed that rosuvastatin was a dominant treatment strategy. Virtually all replications in the PSA resulted in an ICER value less than 25,000 SEK/QALY for the lifetime horizon in the base case population.

The model used a relative risk of 0.49 for the population with a Framingham risk >20% rather than the relative risk of 0.56 for the overall JUPITER trial population. This RR was used since it best represented the shape (slope and height) of the curve for cardiac event risk. However, when the relative risk was varied by 50% in both directions (i.e., between 0.25–0.74), the base case results still indicated that rosuvastatin dominated (more effective and less costly) the no treatment option. This indicated the robustness of results against the relative risk estimate used in the analysis.

The European Societies for Coronary Prevention recommend statin therapy among patients with a Framingham score >20%. This patient population was selected as the base case for our analysis since it reflects the approved indication for rosuvastatin in the EU and reflects a higher risk population with a need for more aggressive statin treatments to address their higher unmet medical need[6,8]. Left untreated these patients are economically burdensome for the Swedish healthcare system to manage, due to their higher cardiovascular risk. It is therefore important to understand the cost-effectiveness implications of interventions aimed at managing this patient population with a high cardiovascular risk. Even when lower risk patients were included in the model population, estimated incremental cost-effectiveness ratios fell below commonly accepted willingness-to-pay threshold values.

The model has certain limitations that need to be considered. Several of the model input parameter estimates were derived from literature or other publicly available data sources with inherent uncertainties around the population values. We attempted to control for this uncertainty, by performing extensive sensitivity analyses, including probabilistic sensitivity analyses, to test the model assumptions. For secondary prevention, Swedish life tables were used in the model to estimate CVD risk with the UK NICE meta-analysis to determine the risk reduction for CVD events attributable to statin therapy. Although the meta-analysis was the strongest published evidence available for event rates, it is possible that the risk distribution of CVD events is different in Sweden than in the UK, given differences in treatment patterns and population demographics[28,29]. The JUPITER trial used a placebo comparison group and, thus, the model simulated the initial prevention based upon a placebo comparison. Future research should attempt to estimate the cost-effectiveness of rosuvastatin treatment as compared to an active statin treatment in prevention of cardiovascular disease. The JUPITER trial included hsCRP as an inclusion criterion for the study population, but the model did not use hsCRP as a risk factor but used the commonly known Framingham risk factors to identify high risk patients. The ratio of PTCA to CABG (80:20) was taken directly from the JUPITER trial; however, the ratio in Sweden and other countries may vary depending upon local treatment patterns. Adverse events were not included in the model because there was no difference in adverse events between rosuvastatin and placebo groups in the JUPITER trial; thus, cost of managing the events would be similar. Indirect costs (lost wages or productivity) were not included in our analysis as we conducted the analysis from a healthcare payer perspective. The indirect costs would most likely be higher in the placebo arm due to the higher number of CVD events. As a result, the cost effectiveness estimates in the model would likely demonstrate higher cost-savings with rosuvastatin 20 mg if the indirect costs were included in the analysis.

Conclusion

Rosuvastatin 20 mg treatment is a cost-effective and cost saving treatment option in patients with a >20% 10 year risk of CVD events based on findings from the JUPITER trial. The cost-effectiveness of rosuvastatin is maintained in the sub-population with high-to-moderate baseline CVD event risk and the overall JUPITER trial population in primary prevention setting.

Transparency

Declaration of funding

This research was supported by AstraZeneca LP. The sponsor was involved in the preparation of this article only through the scientific contributions of Dr Gandhi and Dr Paulsson are employees and stockholders of AstraZeneca. Ms Jensen was an

employee and stockholder of AstraZeneca at the time of the study.

Declaration of financial or other relationships

Dr Ohsfeldt was a consultant and received research funding from AstraZeneca to conduct this study. Dr Olsson has received consultation fees and support for clinical trials from AstraZeneca LP, Karobio, MSD, Pfizer, Roche, Amgen, and Sanofi-Aventis. Dr Gandhi, Dr Paulsson and Ms Jensen are employees and stock holders of AstraZeneca LP.

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