Simvastatin was cost-effective across a broad range of risk and age groups

Heart Protection Study Collaborative Group. **Lifetime cost effectiveness of simvastatin in a range of risk groups and age groups derived from a randomised trial of 20,536 people.** BMJ. 2006;333:1145.

Clinical impact ratings: GIM/FP/GP ★★★★★☆☆ Hospitalists ★★★★★☆☆ Cardiology ★★★★★★☆

QUESTION

Is 40 mg/d of generic simvastatin continued for life cost-effective in patients of different ages with differing risks for vascular disease?

METHODS

Design: Cost-effectiveness study using a Markov model developed from a randomized {allocation concealed*}†, blinded {patients, clinicians, data collectors, and outcome assessors}†,* placebo-controlled trial with mean 5-year follow-up (Heart Protection Study [HPS]).

Setting: 69 U.K. hospitals.

Patients: 20 536 patients 40 to 80 years of age with total cholesterol levels ≥ 3.5 mmol/L (135 mg/dL) and history of coronary disease, cerebrovascular disease, other occlusive arterial disease, diabetes mellitus, or treated hypertension (in men ≥ 65 y). Within the HPS, patients were divided into 5 similar-sized groups by estimated 5-year risk for a major vascular event (12%, 18%, 22%, 28%, and 42%) and were subdivided by age at entry to the study (40 to 49, 50 to 59, 60 to 69, and ≥ 70). The cost-effectiveness results were then extrapolated to older and younger aged persons (down to 35 and up to 85 y) at even lower risk for vascular disease (risk was projected down to 5% compared with 12% in the HPS).

Intervention: Generic simvastatin, 40 mg/d {*n* = 10 269}†, or placebo {*n* = 10 267}†.

Outcomes: Cost-effectiveness of 40 mg/d of generic simvastatin (additional cost per life-y gained). April 2005 costs of 28 days of generic simvastatin were used (£4.87; €7; US$9) and future life-years and costs were discounted at 3.5%/y.

MAIN RESULTS

Simvastatin was cost-effective in every risk and age category in the HPS. Extrapolation beyond the age and risk groups in the HPS showed costs < £2500/y for patients in the lowest risk group and ranging in age from 35 to 85 years, with lower costs or cost savings in all other categories (Table).

CONCLUSION

Lifetime generic simvastatin, 40 mg/d, was cost-effective in patients of different ages with a range of vascular risks.

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*See Glossary.

†**Heart Protection Study Collaborative Group.** Lancet. 2002;360:7-22.

Cost in U.S. dollars ($) and British pounds (£) per life-year gained from full compliance with lifetime generic simvastatin, 40 mg/d, extrapolated beyond the age and risk generally represented in the Heart Protection Study‡

Age at start (y)	5-y risk for major vascular event at start of treatment							
	5%		10%		20%		40%	
	$	£	$	£	$	£	$	£
35	884	450	–707	–360	–2102	–1070	–3163	–1610
45	648	330	–707	–360	–1847	–940	–2436	–1240
55	786	400	–412	–210	–1336	–680	–1631	–830
65	1296	660	98	50	–746	–380	–884	–450
75	2317	1180	884	450	–79	–40	–216	–110
85	4831	2460	2514	1280	963	490	609	310

‡Negative numbers indicate cost savings. The 5% column and the 35- and 85-year age group rows represent categories of patients not generally represented in the Heart Protection Study.

COMMENTARY

The analysis from the Heart Protection Study set in the United Kingdom expands previous work on the cost and benefits of treating patients with a generic statin dose (1). These 2 analyses use both event rate and cost data available for the study population. This current analysis further extrapolates information for patients not present in the study who would have been 5 years older or younger and who would have a 5-year risk for a major vascular event that was substantially lower than the actual study population. The cost results are intriguingly favorable for both those who are at low risk and those who are older. These results fall well into the typically acceptable range for cost-effectiveness in many jurisdictions, including the United States.

In terms of implications for non-UK health systems, the phrase *caveat emptor* is appropriate for 3 reasons. First, the costs of care will differ in different settings, even assuming similar drug prices. The second reason is somewhat more technical but equally important and involves a possible overestimation of drug benefit: The HPS population had a relatively high baseline risk for cardiovascular disease (CVD), with about 4 of 5 patients who would either already have CVD or have a CVD risk equivalent by National Cholesterol Education Program Adult Treatment Panel III standards. Because the amount of risk reduction resulting from statin therapy varies with baseline risk (2), it may be difficult to make accurate predictions of benefit among low-risk patients based on data from high-risk patients; thus, overestimation of treatment effects is possible. Third, it is unclear what the optimal statin dose should be for the greatest benefit. Routine statin treatment in otherwise low-risk patients deserves careful study before widespread adoption.

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References

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2. **Baigent C, Keech A, Kearney PM, et al.** Lancet. 2005;366:1267-78.