Statins for the primary prevention of cardiovascular events in older adults: a review of the evidence
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CRD summary
This review concluded that there was limited evidence to suggest that high-risk elderly patients without a known risk of coronary artery disease may benefit from statin treatment, but more trials were needed. Despite the poor reporting of the review methods, the authors' cautious conclusions and recommendations for further research appear reliable given the limitations of the included data.

Authors' objectives
To review the efficacy, safety and current recommendations for the use of statins in the prevention of cardiovascular disease in older adults.

Searching
PubMed was searched from January 1980 to June 2006 for articles published in English, using the reported search terms. In addition, the reference lists of retrieved articles were checked for additional studies.

Study selection
Randomised controlled trials (RCTs) comparing the effects of statins with placebo, in elderly patients (≥65 years) without a known cardiovascular history, were eligible for inclusion. However, a trial that compared statins with standard treatment was also included in the review. Eligible studies had to: include blinding (as a minimum, blinding of the outcome assessment); follow up participants over a period of at least 3 years; use intention-to-treat data; and assess the number of cardiovascular events. The included studies assessed pravastatin (40mg), atorvastatin (10mg), lovastatin (20 to 40mg) and simvastatin (40mg). The mean age of the included participants ranged from 58 to 75 years, with the number of participants classed as elderly within the trials ranging from 21 to 100% (definitions of 'elderly' varied between trials). The number of included participants with no history of cardiovascular disease varied from 35 to 97% between trials, and the mean baseline low-density lipoprotein cholesterol (LDL-C) level ranged from 116 to 150 mg/dL. The types of cardiovascular events recorded within the included studies varied, but most of the studies included fatal coronary heart disease (CHD) and nonfatal myocardial infarction (MI).

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity. However, a number of validity criteria were used as selection criteria for inclusion in the review.

Data extraction
Baseline cardiovascular risk factors, cardiovascular history and mean baseline LDL-C levels were extracted. Percentage relative risk reductions (RRRs), absolute risk reductions (ARRs) and numbers-needed-to-treat (NNTs) were calculated.

The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
Data from individual studies were summarised in a narrative with accompanying tables of data. Some differences between the studies were evident from the descriptions in the text and the summary data tables.

Results of the review
Six RCTs (56,443 participants), five of which were placebo-controlled, were included in the review. The mean duration of follow-up ranged from 3.2 to 5.3 years, and three of the trials included over 10,000 patients.
The relative risk reductions for cardiovascular outcomes ranged from 10.6 to 37%, the ARRs from 1.06 to 5.6, and the numbers-needed-to-treat from 94 to 18. One large trial (10,305 participants) and one smaller trial (2,838 participants) that compared atorvastatin with placebo reported statistically significant reductions in cardiovascular events in favour of statin; the unadjusted hazard ratios were 0.64 (95% confidence interval, CI 0.47 to 0.86) and 0.63 (95% CI 0.48 to 0.83), respectively. One large trial (10,355 participants) that compared pravastatin with usual care reported no significant differences in cardiovascular events between statin and placebo. However, a smaller trial (5,804 participants) that compared pravastatin with placebo reported a 15% relative risk reduction in the risk of CHD death, nonfatal MI, or fatal or nonfatal stroke over a mean 3.2 years' follow-up. One smaller trial (6,605 participants) comparing lovastatin with placebo reported a risk reduction of 37% for major coronary events, in favour of statin. The largest included trial (20,536 participants) compared simvastatin with placebo and reported that statin therapy achieved an approximate 24% reduction in first major vascular events, regardless of age or prior CHD. However, a number of the trials included younger patients and patients with different cardiovascular risks and histories; data for older patients without known cardiovascular disease were not always available.

Cost information
The authors reported that, depending on the particular statin used, the cost of treatment per month for one patient can range from $30 to $120.

Authors' conclusions
The individual's global risk of CHD should be considered when considering statin treatment guidelines for older adults. Overall, the evidence was limited and further trials were needed. However, high-risk elderly patients without a known risk of coronary artery disease may benefit from statin therapy regardless of baseline LDL-C levels.

CRD commentary
This review answered a clear review question, although inclusion criteria for the type of study design and participants were not adhered to. One electronic source and reference lists were searched for eligible studies, but relevant data may have been missed by the inclusion of only studies published in English; this may have introduced both language and publication bias. The potential for reviewer error and bias during the study selection and data extraction processes was also unclear as the authors failed to report their methods.

Study quality did not appear to have been formally assessed, but a number of quality criteria such as randomisation, blinding, length of follow-up and use of intention-to-treat data were used as selection criteria. It was difficult to assess the reliability of the data without an assessment of individual study quality. The authors' choice of a narrative synthesis appeared appropriate given the differences between the included studies, and a table of overall summary data and statistics was also presented.

Despite the poor reporting of the review methods, the authors' cautious conclusions and recommendations for further research appear reliable given the limitations of the included data.

Implications of the review for practice and research
Practice: The authors stated that current recommendations for statin therapy target patients with higher cardiovascular risk, but the decision to treat elderly patients with lower risk should be based on an individualised global risk assessment, as well as an assessment of possible barriers to long-term adherence.

Research: The authors stated that further prospective RCTs assessing the primary prevention of cardiovascular diseases in elderly patients, especially those aged 75 years or older, were needed to assess tolerability, safety and efficacy. They also commented that a clearer definition of primary prevention and risk in elderly patients was needed, to help clarify those patients who will benefit the most from statin therapy.

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Bibliographic details
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.