A systematic review of the evidence for pharmacist care of patients with dyslipidemia
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CRD summary
The authors concluded that pharmacists, either alone or as an integral part of a multidisciplinary team, play a key role in improving lipid parameters in patients with dyslipidaemia across different settings. This was a well-conducted review and the authors' conclusions reflect the evidence but limitations highlighted by the authors make the reliability of the findings unclear.

Authors' objectives
To assess the effects of pharmacist care on patients with dyslipidaemia.

Searching
Eighteen electronic databases and four trial registries (including MEDLINE, Cochrane CENTRAL, EMBASE and ClinicalTrials.gov) were searched from inception to February 2011. No language restrictions were applied; search terms were reported. A large number of professional associations, scientific meetings and research groups and relevant journals were searched manually.

Study selection
Eligible studies were randomised controlled trials (RCTs) that compared the effects of clearly defined pharmacist care (such as assessment of therapy, education and/or adherence) alone or as part of a health care team versus usual care on patients with dyslipidaemia. The primary outcome was the difference between groups in low-density lipoprotein cholesterol levels. Secondary outcomes included differences in total cholesterol, high-density lipoprotein cholesterol and triglyceride levels, the number of patients who achieved target lipid parameters, number who underwent lipid panel measurements, adherence to therapy and/or changes in lipid-lowering therapy. Studies were excluded if they included only one form of contact between patient and pharmacist or where the unit of randomisation was not at the patient level.

Included patients were at risk for cardiovascular or adverse effects, had diabetes, had coronary heart disease or were patients with dyslipidaemia. Studies were conducted in various outpatient settings that included clinics, home and community pharmacy. Just over half the studies used a collaborative care model; the other studies used independent pharmacist care. Pharmacist interventions commonly included education, drug therapy recommendations and adherence assessment. Study durations ranged from 16 weeks to two years (median 12 months).

Two reviewers independently screened studies for inclusion. Discrepancies were resolved through consensus or referral to a third reviewer.

Assessment of study quality
Two reviewers independently assessed trials for quality using the Cochrane Risk of Bias tool but with no assessment of blinding. Trials were assessed on randomisation, allocation concealment, incomplete outcome data, selective reporting and other bias and were rated as being at low, high or unclear risk of bias. Disagreements were resolved by discussion.

Data extraction
Two reviewers independently extracted dichotomous data to calculate odds ratios and extracted continuous data to calculate mean differences, along with their 95% confidence intervals. Lipid levels at the end of follow-up were used rather than change from baseline.

Primary authors were contacted for further details; where details remained unclear, data were treated as missing.

Methods of synthesis
A random-effects model was used to pool odds ratios (ORs) and weighted mean differences (WMDs) each with their 95% confidence intervals (CIs). Statistical heterogeneity was assessed using the I² statistic. Subgroup analyses were conducted based on type of pharmacist care (independent versus collaborative). Sensitivity analyses were conducted...
based on trial risk of bias.

**Results of the review**

Twenty-one RCTs (5,416 patients) were included in the review. Twelve RCTs were at low risk of bias for randomisation. Fourteen RCTs were at low risk of bias for other biases. Most trials were either at high risk of bias or unclear risk for allocation concealment, incomplete data and selective outcome reporting.

Low-density lipoprotein cholesterol was statistically significantly lower in patients who received pharmacist care compared to standard care WMD -10.7mg/dL (95% CI -16.9 to -4.6; nine RCTs; $I^2=49\%$). Pharmacist care also resulted in lower total cholesterol level (WMD -15.2mg/dL, 95% CI -24.0 to -6.4; 10 RCTs; $I^2=73\%$) and triglyceride levels (WMD -23.0mg/dL, 95% CI -37.2 to -8.9; nine RCTs; $I^2=29\%$). There were no statistically significant differences in high-density lipoprotein cholesterol level.

Subgroup analyses by type of pharmacist care showed statistically significant lower levels of low-density lipoprotein cholesterol but the difference was not significant for independent pharmacist care. Sensitivity analyses that included only trials with adequate randomisation (five RCTs) found that differences between treatment groups in low-density lipoprotein cholesterol levels were no longer statistically significant.

Other findings were reported in the review.

**Authors' conclusions**

Pharmacists, either alone or as an integral part of a multidisciplinary team, play a key role in improving lipid parameters in patients with dyslipidaemia across a variety of settings.

**CRD commentary**

The review question and inclusion criteria were clearly defined. There was a comprehensive literature search with no language restrictions so potential for missed data was reduced. Each stage of the review process was performed in duplicate which reduced the potential for reviewer error and bias. Trial risk of bias was assessed using appropriate criteria and results were incorporated in the synthesis.

Few patient details were reported and it was unclear what regimens and intensities applied to different interventions. Some outcomes showed significant statistical heterogeneity and the authors went some way to investigate this. The authors highlighted certain limitations of the evidence, such as the findings were of modest statistical significance, there were differences in study dates (one trial was published 14 years previously) and trials were not designed exclusively to measure outcomes of pharmacist interventions in dyslipidaemia management. Trials were generally of short duration.

This was a well-conducted review and the authors' conclusions reflect the evidence. The limitations highlighted by the authors make the reliability of the findings unclear.

**Implications of the review for practice and research**

Practice: The authors stated that greater involvement of pharmacists with dyslipidaemia management could have an important effect on public health. Policymakers and pharmacists should embrace this evidence and take steps toward its related implementation.

Research: The authors stated that future research should be targeted at pharmacist prescribing to take interventions to the next level.

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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.