Pharmacist interventions to improve cardiovascular disease risk factors in diabetes: a systematic review and meta-analysis of randomized controlled trials

Santschi V, Chiolero A, Colosimo AL, Paradis G, Burnand B

CRD summary
This review concluded that the use of pharmacist interventions, alone or in collaboration with other health care professionals, could improve major cardiovascular disease risk factors in outpatients with diabetes. Despite some limitations of the review and included trials, there was consistency in the outcomes for blood pressure across the trials, so the authors’ conclusion is reliable for this outcome.

Authors' objectives
To assess the effect of pharmacist care on cardiovascular disease risk factors in outpatients with diabetes.

Searching
PubMed, EMBASE, CINAHL, and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for studies published from inception up to March 2012; search terms were reported in the paper and full strategy was reported in an separate online appendix. Bibliographies of relevant studies were handsearched.

Study selection
Randomised controlled trials (RCTs) that evaluated pharmacist care delivered by a community, hospital or clinical pharmacist compared with usual care on major cardiovascular risk factors (hypertension, dyslipidaemia, smoking or obesity) in adults outpatients with diabetes were eligible for inclusion. The mean age of participants ranged from 49 to 70 years; 52% were women.

Most of the included trials used pharmacists in outpatient clinics. The key components of the interventions varied widely, although most included some form of patient education. Half of the trials were conducted in the USA.

Two reviewers independently selected studies for the review; disagreements were resolved by discussion.

Assessment of study quality
Two reviewers independently assessed trial quality using the Cochrane risk of bias tool; disagreements were resolved by discussion.

Data extraction
Two reviewers independently extracted data in order to calculate mean differences and standard deviations; disagreements were resolved by discussion.

Methods of synthesis
Weighted mean differences, with 95% confidence intervals, were calculated using a random-effects meta-analysis. Heterogeneity was assessed using $X^2$ and $I^2$; $I^2$ above 50% was considered substantial heterogeneity.

Post hoc subgroup analyses were conducted to investigate the type of pharmacist care, number of interventions and setting. Sensitivity analyses were used to investigate the impact of trial quality.

Publication bias was investigated using funnel plots and Egger's test.

Results of the review
Fifteen RCTs were included in the review (9,111 patients; range 40 to 6,963). Of the 15 RCTs, approximately 85% reported using appropriate sequence generation methods, 35% concealed allocation, 15% blinded outcome assessors, 85% were free from reporting bias, and 95% were free from other biases. Duration of follow-up ranged from four to 24 months.

The use of pharmacist care resulted in significantly greater reductions in systolic blood pressure (WMD -6.2mmHg).
95% CI -7.8 to -4.6; 12 RCTs; τ²=2%), diastolic blood pressure (WMD -4.5mmHg, 95% CI -6.2 to -2.8; nine RCTs; τ²=46%), total cholesterol (WMD -15.2mg/dL, 95% CI -24.7 to -5.7; eight RCTs; τ²=75%), low-density lipoprotein cholesterol (WMD -11.7mg/dL, 95% CI -15.8 to -7.6; nine RCTs; τ²=41%), and body mass index (WMD -0.9kg/m², 95% CI -1.7 to -0.1; five RCTs; τ²=92%), but not high-density lipoprotein cholesterol (six RCTs).

Results of post hoc subgroup analyses and sensitivity analyses were also reported.

Results of the test for publication bias showed that bias could be present.

Authors' conclusions
The results of the review supported the use of pharmacist interventions, alone or in collaboration with other healthcare professionals, to improve major cardiovascular disease risk factors in outpatients with diabetes.

CRD commentary
The review addressed a clear review question and had reproducible inclusion criteria. Several relevant sources were searched, although unpublished studies were not sought. Each stage of the review was conducted in duplicate, which reduced the risk of error and bias.

Appropriate criteria were used to assess trial quality, but the only a summary of results was reported. Most of the included trials had at least an unclear risk of bias. One trial contributed approximately 75% of the participants included in the meta-analysis. This large trial was a cluster RCT, and there was no indication whether clustering had been adjusted for in this trial; inadequate adjustment could lead to smaller confidence intervals. There was substantial heterogeneity in the interventions being implemented across the trials, so the generalisability of the results to any one intervention was unclear.

Despite some limitations of the review and included trials, there was consistency in the outcomes for blood pressure across the trials, which is an outcome unlikely to be impacted by lack of blinding.

Implications of the review for practice and research
Practice: The authors did not state implications for practice.

Research: The authors stated that further research was required to assess which pharmacist interventions were the most effective, implementable, and least time-consuming in various types of health care systems or jurisdictions. They also stated that cost-effectiveness should be investigated.

Funding
Canadian Institutes of Health Research; Department of Community Medicine and Health, Switzerland.

Bibliographic details

PubMedID
23173140

Linked records
- Improving blood pressure control through pharmacist interventions: a meta-analysis of randomized controlled trials

DOI
10.2337/dc12-0369
Original Paper URL
http://care.diabetesjournals.org/content/35/12/2706.abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Cardiovascular Diseases /prevention & control; Diabetes Mellitus /drug therapy; Pharmacists; Randomized Controlled Trials as Topic; Risk Factors

AccessionNumber
12013001212

Date bibliographic record published
20/02/2013

Date abstract record published
22/04/2013

Record Status
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.