Quality-improvement strategies for the management of hypertension in chronic kidney disease in primary care: a systematic review

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CRD summary
This review concluded that quality improvement interventions could be effective in reducing blood pressure in high-risk populations with chronic kidney disease or diabetes. The applicability of the findings to lower-risk populations was uncertain. Limitations in the evidence base and review methods suggest that the conclusions should be interpreted cautiously.

Authors' objectives
To assess the effectiveness of quality improvement interventions to reduce systolic blood pressure in people with chronic kidney disease in primary care.

Searching
The databases of the Cochrane Effective Practice and Organisation of Care (EPOC) and Cochrane Renal groups were searched to March 2008. Search terms were reported. The search was limited to English language papers.

Study selection
Controlled or comparative studies (randomised or non-randomised controlled trials and controlled before-and-after studies) of quality improvement interventions were eligible for the review. Participants had to be adults with treated hypertension and stage 3 to 5 chronic kidney disease. Interventions were classified as educational interventions; audit and feedback; and organisational or team change. Studies performed in ambulatory care settings (primary care, community, shared care or hospital outpatients) were eligible. Studies of patients receiving dialysis were excluded. Diabetes with impaired renal function was considered a proxy for chronic kidney disease.

Primary outcome measures were reduction in systolic blood pressure and delay or reduction in the onset of renal failure.

Most included studies involved specific patient groups considered at high risk, often belonging to ethnic minorities. Interventions varied, but most were patient education interventions or specialist diabetes services delivered by nurses or pharmacists.

Two reviewers independently selected studies for the review. Disagreements were resolved by consensus.

Assessment of study quality
The authors did not state that they formally assessed study quality. Data on potential sources of bias were extracted but no further details or results were reported.

Data extraction
For the quantitative analysis the mean difference in change from baseline in systolic blood pressure between intervention and comparator groups and its standard error were extracted or calculated.

The authors did not explicitly state how many reviewers performed the data extraction.

Methods of synthesis
Studies providing quantitative data on blood pressure were combined by meta-analysis using a random-effects model. Statistical heterogeneity was assessed using $I^2$. Subgroup and sensitivity analyses were planned to investigate clinical heterogeneity. It was planned to use funnel plots to investigate publication bias.

Results of the review
Nine studies were included in the review, of which three RCTs (432 participants) and one non-randomised trial (involving 72 general practitioners and 482 patients) were analysed quantitatively.

The intervention groups showed statistically significantly greater reductions in blood pressure compared with control groups (weighted mean difference -10.6, 95% confidence interval -15.8 to -5.3 for three RCTs; WMD -9.3, -15.6 to -3.0 for the non-randomised trial). Statistical heterogeneity was not significant.

Studies not included in the meta-analysis showed positive effects of nurse-provided education, a pharmaceutical care model and highly formalised diabetes education on outcomes other than blood pressure.

The small number of included studies meant that planned sensitivity analyses were not possible.

**Authors' conclusions**
Quality improvement interventions could be effective in reducing blood pressure in high-risk populations.

**CRD commentary**
The review question and inclusion criteria were generally clear. The search appeared adequate, although the databases searched were not explicitly reported. The review was limited to English language publications, so there could be a risk of language bias. It was unclear whether any efforts were made to locate unpublished studies, so the risk of publication bias was uncertain. Study selection was performed by two reviewers, minimising risk of reviewer errors or bias affecting the review.

Quality of the included studies was not formally assessed, so the reliability of these studies and the synthesis based on them is uncertain. Adequate details of included studies were reported. Standard methods were used to pool RCTs reporting the primary outcome, but only three small trials were included. Statistical heterogeneity was not significant, but there were considerable differences between the interventions used, which suggested that meta-analysis may not have been appropriate. Planned sensitivity and subgroup analyses were limited by the small number of included studies. The authors noted various limitations of the review, including a potential lack of generalisability.

The authors' conclusions are in line with the evidence presented, but limitations in the evidence base and the review process suggest that the conclusions should be interpreted with caution.

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

**Practice:** The authors stated that practitioners whose patients have high rates of diabetes and vascular disease could consider implementing targeted services to check for chronic kidney disease in people at increased cardiovascular risk or who have diabetes.

**Research:** The authors stated that trials are needed to establish the effects of quality improvement interventions in low-risk populations.

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