The effect of pharmaceutical care programs on blood pressure control in individuals with hypertension: a meta-analysis

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CRD summary
The authors concluded that pharmaceutical care programmes could significantly improve blood pressure control in patients with hypertension. Evidence appeared to support the authors’ conclusions, but lack of information about participants and interventions make it difficult to assess the general applicability of these findings.

Authors' objectives
To evaluate the association between pharmaceutical care programmes and the control of hypertension.

Searching
MEDLINE, EMBASE, the Cochrane Library, CNKI and CBM were searched from 1999 to February 2008. Search terms were reported. Reference lists of reviews and retrieved studies were also screened.

Study selection
Randomised controlled trials (RCTs) that evaluated pharmaceutical care programmes in patients with hypertension were eligible for inclusion. Eligible trials had to report pre- and post-intervention systolic and diastolic blood pressure. Trials were excluded if data or specific details of interventions were missing; specific details included the provision of medication recommendations to healthcare providers or the provision of medication counselling and health education to patients.

The review assessed end point systolic and diastolic blood pressure, and changes in systolic and diastolic blood pressure.

All of the included patients had essential hypertension.

Two reviewers independently conducted all searches and selected studies.

Assessment of study quality
Trial validity was assessed using the Jadad criteria (randomisation, blinding and withdrawals). Trials scoring 3 or more (out of the maximal 5 points) were considered to be high quality.

The authors did not state how many reviewers assessed validity.

Data extraction
Baseline and end-point systolic and diastolic blood pressure values were extracted with standard deviations (SDs) and used to calculate changes (with SDs) in systolic and diastolic blood pressure.

Two reviewers independently extracted data onto a standardised form.

Methods of synthesis
Pooled standardised mean differences (SMD) and 95% confidence intervals (CI) were calculated using the general inverse variance method. Random-effects models were used in the presence of heterogeneity (p<0.05). Heterogeneity was assessed using the DerSimonian and Laird Q statistic and the I² statistic.

Sensitivity analysis was undertaken by examining the influence of individual studies.

The possibility of publication bias was explored using a funnel plot, and the Begg and Mazumdar's test and Egger's test.
Results of the review

Five RCTs were included (n=621 randomised patients). One trial scored 3 points out of 5 for quality and was classified as high-quality; the others scored 2 points and were considered low-quality. The potential for publication bias was assessed as low, although the possibility could not be excluded.

Systolic blood pressure: Compared with control groups, pharmaceutical care programmes were associated with a statistically significant reduction in end-point systolic blood pressure (SMD -0.48, 95% CI -0.77 to -0.18) and a significant reduction in end-point systolic blood pressure compared with baseline (SMD -2.71, 95% CI -3.47 to -1.94). Significant heterogeneity was found for both analyses (p=0.02 and p=0.001); in both analyses random-effects models were used.

Diastolic blood pressure: Compared with control groups, pharmaceutical care programmes were associated with a statistically significant reduction in end-point diastolic blood pressure (SMD -0.24 (95% CI -0.40 to -0.07; no significant heterogeneity) and a significant reduction in end-point diastolic blood pressure compared with baseline (SMD -1.99, 95% CI -2.93 to -1.06; significant heterogeneity was found, p=0.001). A random-effects model was used).

Results were similar after excluding each trial in turn.

Authors’ conclusions

This review supported the view that pharmaceutical care programmes could significantly improve blood pressure control in patients with hypertension and indicated that it was necessary to provide pharmaceutical care programmes for patients with hypertension.

CRD commentary

The review question was clearly stated and inclusion criteria were appropriately defined. Several relevant sources were searched, but no attempts were made to minimise publication bias. It was not clear if steps were taken to minimise language bias. The potential for publication bias was assessed and acknowledged by the authors. Methods were used to minimise reviewer errors and bias in study selection and data extraction, but it was not clear whether similar steps were taken for the validity assessment.

Study quality was assessed, but only composite scores were presented. No details were provided about the active or control interventions or duration of intervention. Little information was provided about participants. This lack of information made it difficult to assess the general applicability of findings. Appropriate methods were used for the meta-analyses. Heterogeneity was assessed; although significant heterogeneity was found for most analyses, included trials showed a similar direction of treatment effect.

The evidence appeared to support the authors’ conclusions, but the lack of information about participants and interventions make it difficult to assess the general applicability of these findings.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that more studies are required to improve understanding of the relationship between pharmaceutical care programmes and control of blood pressure in patients with hypertension.

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