A randomised controlled trial of the effects of note-based medication review by community pharmacists on prescribing of cardiovascular drugs in general practice

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study examined a general practice-based, community pharmacist-led, note-based medication review of patients with hypertension or angina. Participating pharmacists attended a 1-week training course prior to practice attachment. The course covered such topics as cardiovascular disease, Scottish Prescribing Analysis data, prescribing indicators, repeat prescribing systems, drug information, formularies, evidence-based medicine, communication, implementing guidelines, and study orientation. A follow-up 1-day workshop and a feedback session were held after 6 months to share experiences and to answer logistical or clinical queries.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients younger than 65 years of age who were receiving repeat medication indicative of hypertension or angina.

Setting
The intervention was provided by community pharmacists in a primary care setting. The economic study was conducted in Grampian Region, UK.

Dates to which data relate
The effectiveness evidence appears to have been collected in 1998. The dates to which the resource use referred were between 12 months before the intervention and 12 months after the intervention. The price year was 1999.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample that provided the effectiveness data.

Study sample
This study had 80% power to detect a 10% difference in the key outcomes of treatment at a 5% level. A total of 706 angina and 1,308 hypertension patients were considered. Of these, 340 angina patients and 656 hypertensive patients were randomised to the intervention group, and 366 angina patients and 652 hypertensive patients to the control group. Twenty trained pharmacists and 43 general practices participated in the study. The baseline characteristics of the patients, pharmacists and general practices were comparable.
Study design
This study was a multi-centre, randomised controlled trial in which community pharmacists undertook a single review of the medical records of a random sample of patients and recommended medication changes to the GP as appropriate. The patients were followed up for 6 and 12 months after the intervention. Randomisation was undertaken using random number tables. The follow-up rate at 12 months was 84% of those at baseline.

Analysis of effectiveness
The analysis of effectiveness was conducted on an intention to treat basis. The main health outcomes used in the analysis were:

- patients with a history of myocardial infarction ordering antiplatelet drugs;
- diabetic patients with a history of myocardial infarction ordering ACE-inhibitors;
- avoidance of beta-blockers in those with chronic obstructive pulmonary disease;
- use of lipid-lowering drugs in those with hyperlipidaemia.

Other outcomes were:

- angina patients receiving home visits for cardiovascular disease (CVD);
- angina patients visiting an outpatient department for CVD; and
- angina patients visiting the GP surgery for CVD.

- compliance;

- process indicators (hospital admissions, hospital discharges, referrals to outpatient clinics, number of GP visits);
- clinical indicators (physiological, e.g. blood pressure, body mass index, mortality and morbidity);
- pharmaceutical indicators (e.g. side-effects, drug interactions); and
- quality of life (EQ-5D).

Effectiveness results
Quality of life measures did not differ between the groups.

After the intervention:

- 7.6% (95% confidence interval, CI: 1.7 to 13.8) more patients in the intervention group were ordering antiplatelet drugs;
- 2.9% (95% CI: 0.7 to 5.4) more angina patients in the intervention group received fewer home visits for CVD;
- 3.7% (95% CI: 0 to 7.5) more angina patients in the control group made fewer visits to an outpatient department for CVD; and
- 1.8% (95% CI: 0.6 to 3.5) more angina patients in the control group made fewer visits to the GP surgery for CVD.

Other outcomes showed no significant changes.

Clinical conclusions
Note-based medication review by community pharmacists resulted in small improvements.

**Measure of benefits used in the economic analysis**
The authors did not provide a summary measure of benefits. In effect, the authors carried out a cost-consequences analysis.

**Direct costs**
This study reported the direct costs to the NHS. The costs included in the study were those of hospital admissions, home visits, outpatient attendance, surgery attendance, tests, prescribing and the pharmacists’ time. The unit costs of NHS contacts were calculated using standard methods. Proprietary drug costs were based on the chemist and druggist price list, and generic drugs on the Scottish Drug Tariff. The costs were reported as the median (mean) cost per patient per 6-month period. The costs were not discounted. The price year was 1999.

**Statistical analysis of costs**
A statistical analysis of the costs was conducted. Non-parametric tests (Mann-Whitney test) were applied.

**Indirect Costs**
Productivity costs were not considered.

**Currency**
UK pounds sterling (€).

**Sensitivity analysis**
The examination of uncertainty was restricted to a statistical analysis of the per-patient cost.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
When the pharmacist's time cost was excluded, for the scenarios of all patients, the median (mean) total cost per patient was slightly higher for the intervention group. However, the difference was not significant in the period after intervention for all patients, when the median (mean) costs of the intervention versus control groups were 106.32 (201.41) versus 98.71 (195.20) during 0 - 6 months, (p=0.085), and 92.96 (174.51) versus 88.18 (153.70) during 6 - 12 months, (p=0.091).

When the diagnostic sub-groups were considered separately, the hypertension patients (but not the angina patients) showed statistically significantly higher costs than controls just before and immediately after the intervention. For hypertension patients, the median (mean) costs of the intervention versus control groups were 61.67 (121.96) versus 50.48 (126.14) during the 0 - 6 months before intervention, (p=0.038), 79.39 (120.50) versus 55.72 (121.05) during the 0 - 6 months after intervention, (p=0.034), and 66.67 (132.54) versus 60.16 (111.98) during the 6 - 12 months after intervention, (p=0.063).

For all patients, when the pharmacist time cost was included, the costs of the intervention group were significantly higher than controls in the 6 months after intervention. The median (mean) costs of the intervention versus control groups were 137.29 (231.48) versus 98.71 (195.20) during the 0 - 6 months after intervention, (p<0.001), and 92.96 (174.51) versus 88.18 (153.70) during the 6 - 12 months after intervention, (p=0.091).
Synthesis of costs and benefits
The costs and benefits were not combined because of the cost-consequences approach adopted in the analysis.

Authors' conclusions
Note-based medication review by community pharmacists was found to have made very limited improvements in the care of patients, and was associated with higher National Health Service (NHS) costs.

CRD COMMENTARY - Selection of comparators
The choice of the comparator was justified on the grounds of it being standard practice in the clinics under study. You should decide if these represent valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a randomised, multi-centred prospective trial, which was appropriate for the study question. The study sample appears to have been representative of the study population, with baseline characteristics being presented and power calculations being used to determine the sample size. The methods of randomisation and loss to follow-up were reported, suggesting that the internal validity of the study is likely to be reasonably good. Statistical analyses on the effectiveness data were conducted. In terms of the measure of effectiveness, the relationship between health outcome and the measures used was clear.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The health benefits are, therefore, those associated with the effectiveness outcomes (see comments in the 'Validity of estimate of measure of effectiveness' field above). In effect, a cost-consequences analysis was carried out.

Validity of estimate of costs
The authors took the perspective of the NHS when calculating the costs. The costs were broken down into unit costs and quantities. The source of the price information was specified, thus enhancing the generalisability of the results. Statistical analyses of the costs were carried out.

Other issues
The authors did not compare their results with the findings from other studies. The issue of generalisability was touched on but not fully explored. The authors did not present their results selectively and their conclusions reflected the scope of the analysis. The authors drew attention to several limitations of the study. For instance, the target recruitment numbers for the angina patients were not achieved, long-time benefits were not evaluated, and randomisation by patients within a practice might have resulted in contamination of the control group.

Implications of the study
The benefit of note-based medication review by community pharmacists has been reduced by the high standard of current practice and the possible confounding effect of other ongoing initiatives. The authors suggested a face-to-face patient intervention.

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Other publications of related interest
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Subject indexing assigned by CRD

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