The cost-effectiveness of a clinical pharmacist intervention among elderly outpatients

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
Prescribing practice guidance protocol, in which a clinical pharmacist assesses the appropriateness of medications for elderly patients, and then provides non-mandatory advice to physicians on suitable medications which may be prescribed.

Type of intervention
Prescribing practice advice and guidance.

Economic study type
Cost-effectiveness analysis.

Study population
Patients aged 65 years or older residing in the community, prescribed at least 5 medications on a regular basis. Individuals residing in nursing homes were excluded and cognitively impaired patients were only included if they had a caregiver willing to participate.

Setting
Primary care. The economic analysis was conducted in Durham, North Carolina, USA.

Dates to which data relate
Effectiveness and resource data were collected for a one year period from 1991. 1991 price years were used in the analysis.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was undertaken prospectively using the same patient sample as in the effectiveness analysis.

Study sample
208 patients were randomised, 105 to the intervention group and 103 to the control group. 99% of patients were male, 77% were white and the mean age of patients was 70 years of age. Patients had a mean of nine chronic diseases. It was not reported whether power calculations were used to determine sample size.

Study design
Single centre randomised controlled trial. The duration of follow up was one year. 36 patients (17%) of the total population sample were lost to follow up due to institutionalisation, death or relocation.

**Analysis of effectiveness**
The analysis of effectiveness was based on intention to treat. An intermediate health outcome measure, scores reported on the Medication Appropriateness Index (MAI), developed specifically for the study, was the primary outcome measure. This index assesses the relative appropriateness of medications prescribed to patients, including the risk of adverse effects. At analysis, both intervention and comparator groups were similar in demographic and clinical characteristics.

**Effectiveness results**
MAI scores improved significantly in the intervention group at both 3 months and one year following the addition of pharmacist advice and guidance to primary care physicians compared with the control group. Improved MAI scores were associated with a lower need for care and hospitalisation and with better hypertension control.

**Clinical conclusions**
Improving drug appropriateness for elderly outpatients was achieved by introducing a pharmacist-led prescribing practice protocol.

**Measure of benefits used in the economic analysis**
The benefit measure was an improvement in MAI scores.

**Direct costs**
Total annual costs for both the intervention, drug costs and other health care services used were estimated. Fixed and variable costs associated with training and orientating the pharmacist and delivering the intervention were estimated based on time observations for pharmacist activities recorded during the study and salary data obtained from the Veterans Administration. The costs of health care services were estimated for both Veterans Administration Medical Centre (VAMC) and non-VAMC services. In the VA sector the estimated cost per day for inpatient care was determined from annual outputs and expenditure and surgical costs were also estimated using a weighting system. Drug acquisition and preparation costs were obtained from the VA. The economic analysis was conducted from the perspective of the health service and 1991 price years were used. Costs or benefits were not discounted, because of the short duration of the trial.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
The incremental improvement in MAI scores in the intervention group compared with the control group was 3.9 (+/- 0.7) units after 12 months. MAI scores considered possible side effects associated with treatment.
Cost results
The intervention itself was estimated to cost an average of $120 per patient additionally compared with usual practice, of which $36 consisted of fixed costs apportioned across all 105 patients ($3,790 /105). The annual mean drug costs per patient were $1,006 in the intervention group and $1,096 in the comparator group. Total average annual health care costs (including drug costs) per patient in the intervention and the control groups respectively were $7,873 (1,622 - 6,649, 25% to 75% inter quartile range) and $5,926 (1,608 - 7,036). Neither costs nor use of services differed significantly between the two groups.

Synthesis of costs and benefits
As overall health care service costs were similar between the two groups the incremental cost per unit improvement in MAI scores was estimated to be $30, when considering the additional cost of the intervention only. If the additional reduction in drug costs were included then the incremental cost per MAI unit improvement would fall to $7.50.

Authors' conclusions
The authors concluded that the introduction of the pharmacist advice protocol improved patient prescribing at low cost, although overall use of health care services between the intervention and the comparator did not differ significantly in the study, which is consistent with other reports in the literature. Costs of the intervention were conservatively estimated and would fall if fixed costs were apportioned over a greater number of patients. Further research is required, however, to assess the long term costs and outcomes of such protocols.

CRD COMMENTARY - Selection of comparators
Justification was given for the comparator used as, before the introduction of the intervention, this was usual practice at the study clinic.

Validity of estimate of measure of benefit
Benefits were reported from a randomised controlled trial conducted by the authors. The instrument used to measure benefit, the MAI, was developed specifically for the study, and has subsequently been validated elsewhere. It may, however, have been helpful to the reader if a little extra detail been provided on what criteria for assessing benefit were used, although a reference to the full manual is provided. Additionally it may be helpful in future studies also to report on the incidence of drug related adverse events experienced in the two groups in addition to providing MAI scores, or alternatively to elicit quality of life scores from patients in the two groups.

Validity of estimate of costs
Sufficient details were provided on sources of cost estimates. Costs were determined from the perspective of the health care system, and it may be useful in future analyses to consider costs to other in society, particularly informal caregivers in the case of elderly individuals.

Other issues
Authors themselves note that the study was based at a single clinical location and therefore the results may not be generalisable to other locations or settings.

Implications of the study
Well designed long term economic evaluations of interventions influencing physician prescribing practice are required.

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