Evaluation of the cost savings and clinical outcomes of switching patients from atorvastatin to simvastatin and losartan to candesartan in a primary care setting

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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 switching the patients' medication from 10 or 20mg atorvastatin to 20 or 40mg simvastatin for the treatment of high cholesterol, and from losartan to candesartan (4mg candesartan per 25mg losartan) for the control of hypertension.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
This study comprised two study populations. One was patients with a repeat prescription for atorvastatin, while the other was patients with a repeat prescription for losartan. The authors reported a variety of exclusion criteria.

Setting
The setting was outpatient, primary care. The economic study was carried out in Letchworth Garden City, UK.

Dates to which data relate
The clinical effectiveness and resource use data related to 2005. The price year was 2005.

Link between effectiveness and cost data
The cost data were collected in relation to the patients that provided the clinical evidence.

Study sample
The study samples were identified by selecting all patients prescribed atorvastatin or losartan from the practice list. These patients were reviewed by the practice pharmacist and their general practitioner (GP) and excluded if they were not considered suitable to switch medication. A total of 122 patients prescribed atorvastatin were identified. Of these, 43 were excluded by the practice pharmacist and 9 were excluded by the GP, leaving a final sample of 70 patients. A total of 137 patients on losartan were identified. Of these, 11 were identified as unsuitable by their GP, 3 had no history of angiotensin-converting enzyme inhibitor use, 2 had recently had losartan stopped by secondary care, and a further 6 requested not to switch medication. This resulted in a patient sample of 115. No sample size or power calculations were included in the paper.

Study design
The study comprised two single-centre, within-group, comparison studies. Data were collected on the patient groups at baseline, and at 3 to 4 months and 10 months after the medication switch. In the atorvastatin group, follow-up data were collected on 69 of the 70 patients (one patient experienced adverse effects that were attributed to simvastatin and was switched back to atorvastatin). In the losartan group, outcomes at 3 to 4 months were available for 98 of the 115 initial patients. Of the 17 patients without outcome measurements, 7 were switched back to losartan and 10 did not have a routine measurement recorded and did not respond to a request to attend the surgery. There was no blinding and no wash-out period in this study.

**Analysis of effectiveness**

The 3- to 4-month outcome was serum cholesterol for the atorvastatin group and blood pressure in the losartan group. The 10-month outcome measured for both groups was new diagnoses of ischaemic heart disease or cerebrovascular accidents. The analysis only included those patients who remained on simvastatin or candesartan.

**Effectiveness results**

At 3 to 4 months, the mean serum cholesterol was 4.10 mmol/L (standard deviation, SD=0.73) with atorvastatin compared with 4.07 mmol/L (SD=0.55) with simvastatin, \( p=0.66 \). At 10 months, none of the patients had had a new diagnosis of ischaemic heart disease or cerebrovascular accidents.

At 3 to 4 months, the mean systolic blood pressure of patients with diabetes was 137.0 mmHg (SD=17.4) with candesartan compared with 137.4 mmHg (SD=12.5) at baseline, \( p=0.91 \). The mean diastolic blood pressure changed from 77.0 mmHg (SD=4.9) at baseline to 73.5 mmHg (SD=6.7), \( p=0.034 \).

At 3 to 4 months, the mean systolic blood pressure of patients with cardiovascular disease was 133.7 mmHg (SD=15.2) with candesartan compared with 134.1 mmHg (SD=13.7) at baseline, \( p=0.87 \). The mean diastolic blood pressure changed from 75.6 mmHg (SD=6.4) at baseline to 70.6 mmHg (SD=8.9), \( p=0.009 \).

At 3 to 4 months, the mean systolic blood pressure of patients without diabetes or cardiovascular disease was 137.2 mmHg (SD=13.5) with candesartan compared with 141.9 mmHg (SD=12.9) at baseline, \( p=0.012 \). The mean diastolic blood pressure changed from 80.8 mmHg (SD=7.4) at baseline to 79.5 mmHg (SD=7.3), \( p=0.19 \).

At 10 months one patient had two cerebrovascular accidents. The authors stated that it was unlikely that these events were due to the change in medication.

**Clinical conclusions**

The authors concluded that switching patients from atorvastatin to simvastatin and from losartan to candesartan did not have any negative clinical outcomes.

**Measure of benefits used in the economic analysis**

No measure of health benefit was used in the economic evaluation. In effect, a cost-consequences analysis was conducted.

**Direct costs**

The direct costs of the general practice were identified in the study. Details of the unit costs were included in the paper, but their source was not specified. Resource use was taken from the same patient groups that provided the clinical evidence. The price year was 2005. The study calculated the costs for the general practice and extrapolated these figures to the primary care trust and nationally.

**Statistical analysis of costs**

The cost data were treated deterministically.
Indirect Costs
No productivity costs were included in this study.

Currency
UK pounds sterling (€).

Sensitivity analysis
No analyses were undertaken to allow for uncertainty in the cost data.

Estimated benefits used in the economic analysis
See clinical effectiveness results reported above.

Cost results
The net saving to the general practice of switching patients from atorvastatin to simvastatin was 12,715.58 for the first year, rising to 14,712.88 in subsequent years.

Switching patients from losartan to candesartan resulted in a net saving of 13,374.40 in the first year, followed by 14,008.67 in subsequent years.

Synthesis of costs and benefits
A synthesis of the costs and benefits was not relevant.

Authors’ conclusions
Switching patients prescribed atorvastatin to simvastatin and patients prescribed losartan to candesartan resulted in significant cost-savings without any negative clinical consequences.

CRD COMMENTARY - Selection of comparators
This study compared current prescribing practice in the authors’ setting and the use of generic drugs as set out in guidance from the primary care trust. You should consider how the prescribing regimens used in this study compare with current practice in your own setting before applying the results of this study.

Validity of estimate of measure of effectiveness
The clinical effectiveness data were taken from a within-group comparison study, which has limited internal validity. No rationale was provided for the authors’ choice of study design. A randomised controlled trial, which either switched or did not switch the patients’ prescription, would have provided more robust clinical effectiveness data. The analysis of the clinical data was limited to those patients who remained on the switch medication for the study period. As no sample size or power calculations were reported in the paper, it was unclear whether the sample size was sufficient to identify any difference in clinical outcomes after the switch in medication.

Validity of estimate of measure of benefit
No summary measure of health benefit was included in the economic analysis. In effect, a cost-consequences study was conducted.

Validity of estimate of costs
The costs of the general practice were identified in this study and all appropriate costs appear to have been included in the analysis. Resource use and unit costs were reported in the paper, but the source of the unit costs was not specified. No statistical or sensitivity analysis was undertaken to assess uncertainty in the cost data. Although the authors extrapolated their findings for periods longer than 12 months, no discounting was reported. These factors limit the generalisability of the study findings. A clear price year was reported, which will facilitate future reflation exercises.

**Other issues**
The authors do not appear to have presented their results selectively and their conclusions reflected the scope of their analysis. They compared their clinical findings in relation to other relevant studies, but did not compare their cost calculations with other studies. This study sought to identify the implications to the authors’ practice of changing prescriptions. The authors extrapolated their findings to the primary care trust and nationally. However, they did not consider whether their practice population differed from the patient population across the primary care trust and the country.

**Implications of the study**
The authors did not make any recommendations for further research or changes to practice.

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