Conversions from captopril to lisinopril at a dosage ratio of 5:1 result in comparable control of hypertension

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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
Continuing the use of captopril or switching to lisinopril therapy at an initial daily conversion ratio of captopril 5 mg to lisinopril 1 mg in patients with mild-to-moderate hypertension.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients suffering from mild-to-moderate hypertension and who were treated by captopril alone.

Setting
Hospital. The study was carried out in Southern California, USA.

Dates to which data relate
Effectiveness and resource date were collected from Dec 1988 to Dec 1993. The price year was not reported.

Source of effectiveness data
The evidence for the final outcomes was derived from a single study.

Link between effectiveness and cost data
Costing was undertaken retrospectively and not on the same patient sample as that used in the effectiveness study. Instead it was performed on the basis of information available on the conversion programme for the population of patients in the area and in the entire region.

Study sample
Power calculations were not used to determine the sample size. Medical files for a total of 185 patients were reviewed, and 35.68% (66 patients) were excluded. Of those patients invited to participate in the study, about 40% (48 patients) refused. A total of 71 patients agreed to participate and were randomly assigned to either the captopril group (29 patients to continue receiving captopril therapy) or to the lisinopril group (27 patients).

Study design
The study was a randomised controlled trial, carried out in a single centre. The study duration was 16 weeks (4 weeks pre-randomisation and 12 weeks post-randomisation). The overall loss to follow up was 21% (15 patients).

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The primary health outcomes measured in the study consisted of systolic and diastolic blood pressure, the final conversion ratio, and the frequency of adverse effects. The groups were shown to be comparable in age, sex, race, height, weight, use of alcohol and caffeine, changes in sodium intake and the use of nonsteroidal anti-inflammatory drugs (NSAIDs).

Effectiveness results
The average (+/-SD) pre-randomisation and 12-week post-randomisation systolic blood pressure for the captopril group were 138.1 (+/- 18.19) (95% CI: 131 - 145) and 134.0 (+/- 20.2) (95% CI: 127 - 142), respectively. The corresponding figures for the lisinopril group were 134.0 (+/- 14.7) (95% CI: 128 - 140) and 125.6 (+/- 21.2) (95% CI: 118 - 134), respectively. The average (+/-SD) pre-randomisation and 12-week post-randomisation diastolic blood pressure for the captopril group were 82.4 (+/- 8.8) (95% CI: 79 - 86) and 80.2 (+/- 8.1) (95% CI: 79 - 82), respectively. The corresponding figures for the lisinopril group were 84.8 (+/- 7.7) (95% CI: 83 - 86) and 77.5 (+/- 8.9) (95% CI: 74 - 81), respectively. No significant differences in blood pressure were discovered either within or among the study groups (p>0.05). The final conversion ratio in the lisinopril group was 4.9 (+/- 1.6) (95% CI: 4.3 - 5.5), which was not significantly different from the initial 5:1 conversion ratio. The groups had approximately similar frequencies of adverse effects (p>0.05).

Clinical conclusions
The study revealed that lisinopril was as effective as captopril in the control of mild-to-moderate hypertension with a similar rate of complications.

Measure of benefits used in the economic analysis
The main benefit measures were systolic and diastolic blood pressure, the final conversion ratio, and the frequency of adverse effects.

Direct costs
Quantities and costs were not reported separately. The total cost savings were calculated both for the area and for the entire region. The cumulative cost saving was the result of the difference between the projected costs (if there was no conversion) and the estimated costs (the cost of the lisinopril therapy) for the whole period using average wholesale price (AWP). The costs consisted of drug costs only. The perspective for the cost analysis was not stated. No dates were given for the price data used in the study.

Indirect Costs
Not calculated.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
The average (+/-SD) pre-randomisation and 12-week post-randomisation systolic blood pressure for the captopril group were 138.1 (+/-18.19) (95% CI: 131 - 145) and 134.0 (+/- 20.2) (95% CI: 127 - 142), respectively. The corresponding figures for the lisinopril group were 134.0 (+/- 14.7) (95% CI: 128 - 140) and 125.6 (+/- 21.2) (95% CI: 118 - 134), respectively. The average (+/-SD) pre-randomisation and 12-week post-randomisation diastolic blood pressure for the captopril group were 82.4 (+/- 8.8) (95% CI: 79 - 86) and 80.2 (+/- 8.1) (95% CI: 79 -82), respectively. The corresponding figures for the lisinopril group were 84.8 (+/- 7.7) (95% CI: 83 - 86) and 77.5 (+/-8.9) (95% CI: 74 - 81), respectively. No significant differences in blood pressure were discovered either within or among the study groups (p>0.05). The final conversion ratio in the lisinopril group was 4.9 (+/- 1.6) (95% CI: 4.3 - 5.5), which was not significantly different from the initial 5:1 conversion ratio. The groups had approximately similar frequencies of adverse effects (p>0.05).

Cost results
The cumulative cost savings for the area and the entire region as a result of the conversion programme from captopril to lisinopril therapy were $287,231.55 and $4,799,279.86, respectively.

Synthesis of costs and benefits
A synthesis was not conducted by the authors since lisinopril therapy was a weakly dominant strategy.

Authors' conclusions
The conversion from captopril (in equally divided daily dose) to lisinopril (once daily) at a dosage of 5:1 maintained comparable control of mild-to-moderate hypertension with no increase in adverse effects. In addition, the cost savings associated with an overall drug conversion program were substantial, and the conversion provided a preferred once-daily dosing regimen.

CRD COMMENTARY - Selection of comparators
No justification was provided for the choice of the comparator, and you should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The estimates of the benefits are likely to be internally valid.

Validity of estimate of costs
As the authors noted, a number of factors (retrospective costing, omission of all items of costs except drug costs, and use of a different patient sample for the effectiveness analysis) may cast doubts on the internal validity of the cost estimation.

Other issues
Lack of sensitivity analysis and statistical analysis of the costs may hinder the generalisability of the results to other settings.

Source of funding
None stated.

Bibliographic details