Cost effectiveness analysis of a dry powder inhaler (Turbuhaler) versus a pressurised metered dose inhaler in patients with asthma
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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
Two different kinds of inhalers: using an aerosol pressurised metered dose inhaler (pMDI) or a dry powder inhaler (Turbuhaler) in patients with asthma.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients (aged at least 18 years old) with asthma, who had used inhaled corticosteroids and/or inhaled B2-agonists via a pMDI for at least 6 months before the study started.

Setting
Primary care and hospital. The economic study was carried out in Canada.

Dates to which data relate
Effectiveness and resource use data were obtained from a study published in 1996. The fiscal year was 1993.

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

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
Power calculations were not reported as having been used to determine the sample size. Overall, 1,004 patients were included in the study from 7 countries (Australia, Canada, Finland, France, Germany, Spain, and the UK). A subpopulation of 445 patients was analysed in this study. Half of the patients continued with the regimen with inhaled corticosteroids and/or inhaled B2-agonists while the other half were administered budesonide and/or terbutaline via Turbuhaler. Six patients in each group were excluded from the initial sample. The average age of the patients in the pMDI group (n=215) was 41 years versus 40 years in the Turbuhaler group (N=218).
Study design
The study used a randomised parallel group design, and was carried out in 7 countries. The duration of the study was 52 weeks. The loss to follow-up for the Turbuhaler group was 43 patients (19.7%) and for the pMDI group, 46 patients (21.4%), (the differences between the groups were not significant).

Analysis of effectiveness
The analysis of the clinical study was based on intention to treat. The primary health outcomes were the number of exacerbations (the sum of health care contacts plus doubling of/addition of inhaled corticosteroids) and the number of days with exacerbations. Both groups were comparable with regard to demographic variables (except for gender) and prognostic features.

Effectiveness results
The number of exacerbations in the Turbuhaler treatment group was 0.59 fewer than in the pMDI treatment group (1.33 versus 1.92, p=0.03). There were 2.43 fewer days with exacerbations in the Turbuhaler group than in the pMDI group (5.0 versus 7.43, p=0.03).

Clinical conclusions
The effectiveness of treatment, measured as the number of exacerbations and the number of days with exacerbations, was significantly improved when medication was given through the Turbuhaler.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic study, and only separate clinical outcomes were reported.

Direct costs
Cost were not discounted due to the short duration of the study (less than one year). Quantities and costs were reported separately. The health service costs included were planned visits to primary care, acute visits to primary care, planned visits to hospital, acute visits to hospital, telephone contacts, other contacts, and hospitalization days. Health care resource utilization was collected from the patients' record forms. The best available price (BAP) was the source of medication prices. 1993 price data was used.

Statistical analysis of costs
Student's t test was used to compare the groups in terms of costs. Regression analyses were performed, using the total costs and total direct costs as dependent variables.

Indirect Costs
Costs were not discounted due to the short duration of the study (less than one year). The indirect costs considered were costs for patients' absence from work (loss of production). Quantities and costs were reported separately. Average wage was attributed to each day off work (two separate rate were used for employed and non-employed patients). 1993 price data were used.

Currency
Canadian dollars (Can$). The exchange rate as at 10 May 1996 was US$1= Can$1.36

Sensitivity analysis
Sensitivity analysis was carried out on the most costly patient.
Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total annual costs of treatment were on average, less for patients using Turbuhaler (Can$990) than for those using a pMDI (Can$1,320.8), (p<0.01).

Synthesis of costs and benefits
A synthesis was not undertaken by the authors since the intervention was the dominant strategy. Performing sensitivity analysis on the most costly patient did not alter the results dramatically.

Authors' conclusions
The results of this study suggest that treatment via a Turbuhaler is a cost-effective strategy in patients with asthma in Canada.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparators used.

Validity of estimate of measure of benefit
The study design was appropriate, but a more detailed explanation of the method of randomization would have been useful.

Validity of estimate of costs
Resource use data were reported separately from the costs and adequate details of methods of cost estimation were provided.

Other issues
A more comprehensive sensitivity analysis may have enhanced the generalisability of the results to other settings or countries.

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