Cost-effective management of malignant potentially fatal 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
Asthma management intervention programme tailored for specific patients with malignant potentially fatal asthma. The programme included regular clinic visits, patient and family education, 24-hour telephone access, simplified medical regimens, adequate anti-inflammatory medication and, if indicated, psychiatric referral. These measures included the building of doctor/patient relations and, for some, the use of depot injections and/or free medication.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with potentially fatal asthma, whose disease was deemed to be unmanageable on account of non-compliance.

Setting
The practice setting was a hospital outpatient department. The economic study was carried out in Illinois, USA.

Dates to which data relate
Not reported for effectiveness and resource use data.

Source of effectiveness data
Estimates of effectiveness were based on a single study. Prices were taken from itemised charges for representative patients during the period from January 1994 to July 1995.

Link between effectiveness and cost data
Costing was performed on a representative patient for the pre-intervention period and on the same patient sample as that used in the effectiveness analysis for the post-intervention period.

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 8 patients ranging in age from 22 to 85 years.

Study design
This was a before and after study, carried out in a single centre. The duration of follow up was at least 4 years since...
initiating the treatment programme. No loss to follow-up was reported (it was only reported that a total of 172 patients were treated in the study centre, of which five (2.9%) died from asthma).

**Analysis of effectiveness**
The principle (intention to treat or treatment completers only) used in the analysis of effectiveness was not explicitly specified. The primary health outcomes were fatal and near fatal outcomes, and the number of admissions to hospital, including intensive care unit admissions and emergency room visits.

**Effectiveness results**
No fatal or near fatal incidents occurred after the institution of the comprehensive treatment programme. The introduction of the intervention resulted in three of eight patients not requiring any further hospitalisations, and three more not having been hospitalized for at least 4 years after its initiation. The total number of hospitalisations for the eight patients in the pre-intervention period was 50, while it was reduced to 13 cases after the initiation of the treatment programme.

**Clinical conclusions**
The non-compliant behaviour of patients with malignant potentially fatal asthma makes them most difficult to study. However, by selecting only those people who they were actively following, the authors felt that they could accurately assess the effects of their comprehensive regimen.

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

**Direct costs**
Costs were not discounted despite a follow-up period of at least 4 years. Quantities of resources in terms of hospital admissions were reported separately from the costs. Since the complete records for pre-intervention care were not available, the authors limited their analysis to the lowest possible cost of hospital care. This was measured by the number of emergency room visits and by the number of admissions for both intensive and inpatient care. The boundary adopted in the cost analysis was that of the hospital. For the estimation of hospital cost for the patients prior to the intervention, the authors made assumptions to approximate 'a typical admission for status asthmaticus'. Prices were derived from itemised charges for a representative patient at the study hospital, taken from the period January 1994 to July 1995. Dates for resource use data were unclear.

**Statistical analysis of costs**
The mean costs per patient per year and the associated standard deviations were calculated. Costs were analysed using both parametric (within-subjects t-test) and non-parametric (optimal discriminant analysis) methods.

**Indirect Costs**
Not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.
Estimated benefits used in the economic analysis
Not applicable.

Cost results
The average post-intervention cost per patient per year was $1,107, with a standard deviation of $1,618. The equivalent pre-intervention cost was $22,999, with a standard deviation of $20,639. The statistical significance of this result was established by using the t-test, which gave a value of P<0.02, and by using the optimal discriminant analysis, which gave a value of P<0.0017.

Synthesis of costs and benefits
A synthesis of costs and benefits was not performed since the use of the intervention was the dominant strategy.

Authors' conclusions
The treatment programme is an effective and cost-saving method of preventing acute episodes of asthma in exceptionally high-risk patients.

CRD COMMENTARY - Selection of comparators
A justification was given for the choice of the comparator used. Asthma care without a specific preventative programme was chosen as the comparator, which represented typical asthma care. You, as a user of this database, should consider whether this is a standard practice in your own setting.

Validity of estimate of measure of benefit
The internal validity of the estimates of effectiveness can not guaranteed due to the retrospective nature of the study design and its small sample size. In view of the lack of an explicit summary benefit measure, the study may be regarded as a cost-consequences analysis.

Validity of estimate of costs
Various costs were omitted from the analysis, including the cost of intervention, the cost of outpatient care, and indirect costs. Some of these costs would have been common to both before and after the intervention, but it remains unclear how those remaining would have affected the authors' findings on cost-effectiveness. For the costs that were calculated, adequate details of methods of cost estimation were given. Overall, the study lacked a prospective cost analysis based on true costs.

Other issues
The authors did not address the issue of generalisability to other settings and appropriate comparisons with other studies were not made. The results do not appear to have been presented selectively. However, the sample size of only eight patients and the before-and-after design of the study, which is subject to a number of biases, make the results difficult to interpret. Given the uncertainties in the data, it is not possible to judge whether the authors' conclusions are justified. A cost-utility approach may have been more appropriate to the context in question.

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