Cost-effectiveness of a structured treatment and teaching programme on 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
Structured treatment and teaching programme for asthma sufferers (ATTP).

Type of intervention
Prevention and treatment.

Economic study type
Cost-benefit analysis.

Study population
Adult patients with moderate to severe asthma. The mean age was 40 (range: 16-75) years and the median duration of asthma was 12 (range: 1-56) years. 57% of the study population were employed.

Setting
University hospital. The economic study was carried out in Dusseldorf, Germany.

Dates to which data relate
Effectiveness data were collected between November 1986 and September 1988. 1991 prices were used.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
142 patients with a primary diagnosis of asthma, substantiated by a rise in FEV1 (forced expiratory volume in one second) of at least 15% after inhalation of beta-agonist were included in the study. Power calculations were not used in determining the sample size. Duration of follow-up was 3 years.

Study design
Case series. The study was conducted at a single site. The loss to follow-up was 7% for the first year.

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The primary health outcomes used in the analysis were: number of severe asthma attacks (requiring emergency treatment by a physician) and improvement of pulmonary function tests. Questionnaires were used to estimate number of asthma attacks.

**Effectiveness results**
The year before the introduction of ATTP, 4.8 severe asthma attacks were recorded per patient, per year. After ATTP, there was one severe attack per patient, per year (mean of years 1-3).

**Clinical conclusions**
A decrease in the number of severe asthma attacks and an improvement of pulmonary function tests were noticed.

**Measure of benefits used in the economic analysis**
Severe asthma attacks avoided, improvement of pulmonary function tests, all finally expressed in monetary terms.

**Direct costs**
The following direct health service costs were considered: hospital costs, nursing, physician visits. Discounting was applied for the second and third years at a rate of 5%. Quantities and costs were not analysed separately. The price year was 1991.

The costs to society, expressed in days absence from work, were considered. Discounting was applied at 5% to the average gross monthly salary. No other indirect costs were included. Price year was 1991.

**Statistical analysis of costs**
The statistical significance of the reduction in hospital days, days of absence from work, asthma attacks and physician consultations were tested using the Wilcoxon signed-rank test. Drug consumption patterns were analysed by Friedman's test adjusted for ties. P values of <0.05 were considered statistically significant.

**Currency**
German Marks (DM).

**Sensitivity analysis**
Sensitivity analyses were performed on all the key variables which might have influenced the result of the analyses. The variables included average salary, number of days absent from work, savings from reductions in asthma attacks and physician costs. 1-way, 2-way and 3-way sensitivity analyses were employed. Quality of life issues were not included in any estimate of benefits.

**Cost results**
For each DM spent on ATTP, society as a whole saved DM5 and the paying bodies saved DM2.70.

**Synthesis of costs and benefits**
The net incremental benefits of ATTP per patient within 3 years were estimated at DM12,850 (all costs and benefits) and DM5,900 (direct costs and benefits only). Overall, the benefit/cost ratio was 5.0 (all costs and benefits) and 2.7 (only direct costs and benefits). One way sensitivity analysis showed that there were always net savings within three years for any average salary, for any reduction in days of absence from work and for any savings from reduction in asthma attacks and physician consultations. Overall, the result was stable over a reasonable range of variation of the key variables.
Authors' conclusions
This programme deserves implementation, not only for its demonstrated medical benefits, but also for its economic savings.

CRD COMMENTARY - Selection of comparators
The reason for choice of comparator is clear (standard treatment).

Validity of estimate of measure of benefit
Using a follow-up questionnaire to determine estimates of benefits (asthma attack (avoided)) may introduce inaccuracies due to imprecise recall by patients.

Validity of estimate of costs
The use of third party costs may have produced distortions when compared with real costs. In addition, gross average salaries were used to represent loss of productivity which may overestimate losses in some instances. Loss of earnings/productivity was not assessed for patients not in full time employment (housewives and students etc), although sensitivity analyses did take this point into consideration.

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