Targeted routine asthma care in general practice using telephone triage
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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 targeted routine asthma care in general practice using telephone triage. A trained asthma nurse contact patients by telephone at 6-monthly intervals to complete the Royal College of Physicians (RCP) three questions. The RCP three questions, which the British Asthma Guidelines recommends for assessing asthma morbidity, are as follows.

Have you had difficulty sleeping because of your asthma symptoms (including cough)?
Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness or breathlessness)?
Has your asthma interfered with your usual activities?
Another two questions related to a high-risk of asthma death were also used:
Have you ever needed treatment in intensive care for your asthma?
Have you been admitted to hospital with your asthma within the last year?
For low-risk patients, the nurse formulated an individualised asthma action plan with the patient, with advice on what to do if asthma control deteriorated. For high-risk patients, a clinic asthma review was actively arranged.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged 17 to 70 years with asthma. Patients were excluded from the study if they were housebound, did not possess a telephone, or were unwilling to give informed consent.

Setting
The setting was primary care. The economic study was carried out in England.

Dates to which data relate
The enrolment of patients who provided the effectiveness and resource use data took place from December 2002 to March 2003. The price year was presumably 2004.

Source of effectiveness data
NHS Economic Evaluation Database (NHS EED)
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The effectiveness evidence was derived from a single study.

**Link between effectiveness and cost data**
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness analysis.

**Study sample**
Power calculations were carried out in the preliminary phase of the study. These suggested that a sample size of 115 in each group would provide 90% power to prove the hypothesis of equal effectiveness of the two interventions. However, due to a low recruitment rate and a high drop-out rate in the clinic group, the final study sample had a power of 74%. Overall, 194 patients were enrolled, 97 in each group. The mean age was 49.6 (+/- 16.1) years in the clinic group and 50.8 (+/- 15.4) years in the intervention group. There were 59 female participants in the clinic group and 47 in the intervention group. However, 15 patients in the clinical group and 7 in the intervention group did not attend the baseline visit.

**Study design**
This was a prospective, randomised controlled trial that was carried out in a semi-rural practice in Wiltshire, England. The patients were randomised, using random number tables, on a one-to-one basis into one of the two groups. In addition, the patients were stratified into severe asthmatics (on beclometasone or equivalent, greater than 800 microg/day) or mild/moderate asthmatics (on beclometasone or equivalent, 800 microg/day or less). The patients were followed up for 12 months. Of the patients attending the baseline visit, 20 patients were lost to follow-up in the clinical group, while 5 patients were lost to follow-up in the intervention group. Thus, the number of patients available at final assessment was 62 in the clinic group and 84 in the intervention group. Blinding was not performed.

**Analysis of effectiveness**
The analysis of the clinical study appears to have been restricted to treatment completers only. The primary outcome measure was the 6-question asthma control questionnaire (ACQ). Other clinical end points were health status, as measured by the mini asthma quality of life questionnaire, and exacerbations (both mild and severe). Questionnaires were administered by post to all patients at baseline, 6 and 12 months. Patient satisfaction was also evaluated. The baseline comparability of the study groups was not discussed.

**Effectiveness results**
Both groups showed improvements in the ACQ, but the difference between the groups was not statistically significant. Differences in the other measures did not reach statistical significance.

The level of satisfaction was high in both groups. Of the telephone patients, 88% expressed a strong preference for this system compared with their previous system of care.

**Clinical conclusions**
The effectiveness analysis showed that the two interventions were equally effective.

**Measure of benefits used in the economic analysis**
As the two interventions were considered to be equally effective, no summary benefit measure was used. A cost-minimisation analysis was therefore carried out.

**Direct costs**
The cost analysis was undertaken from the perspective of the NHS. Three main categories of costs were included.
Specifically, routine care (including nurse administration time and clinical time), medications (inhalers and tablets) and non-routine care (non-routine consultations and inpatient stay). The quantities of resources used were reported, but unit costs were not. Resource use was based on data derived from the sample of patients included in the effectiveness analysis using prospective information. The costs were estimated from typical NHS sources, including Personal Social Services Research Unit, NHS reference costs, and the British National Formulary. Discounting was not relevant as the costs were incurred during 12 months. The price year appears to have been 2004.

**Statistical analysis of costs**
The costs were presented as mean values with standard deviations. A bootstrap approach was used to assess the statistical significance of cost-differences.

**Indirect Costs**
The indirect costs were not included.

**Currency**
UK pounds sterling (€).

**Sensitivity analysis**
A sensitivity analysis was carried out to assess the impact of hospital stay on total costs by eliminating these items from the cost analysis.

**Estimated benefits used in the economic analysis**
See the Effectiveness Results- section.

**Cost results**
The total routine care costs were 41.72 (+/-13.59) in the clinic group and 18.23 (+/-11.55) in the intervention group. The difference was 23.63, (p<0.001).

The total medication costs were 218.22 (+/-252) in the clinic group and 161.78 (+/-195.45) in the intervention group. The difference was 55.74, (p=0.309).

The total non-routine care costs were 73.91 (+/-272.89) in the clinic group and 29.83 (+/-64.04) in the intervention group. The difference was 44.15, (p=0.275).

The total costs were 333.85 (+/-410.64) in the clinic group and 209.85 (+/-220.94) in the intervention group. The difference was 122.35, (p=0.071).

When the costs associated with hospital stays were excluded, the difference in mean cost per patient between the two groups was reduced to 93, (p=0.115).

**Synthesis of costs and benefits**
A synthesis of the costs and benefits was not relevant as a cost-minimisation analysis was performed.

**Authors' conclusions**
Targeted routine asthma care by telephone triage of adult asthmatics led to more asthma patients being reviewed, at lower cost per patient and without loss of asthma control, in comparison with usual routine care in the surgery.
CRD COMMENTARY - Selection of comparators
The selection of the comparator was appropriate as it reflected usual care and was accurately described. You should decide whether this is a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a clinical trial, which was appropriate for the study question since the use of a randomised design should have reduced the impact of selection bias. The methods of randomisation and sample selection were described. The study groups appear to have been well balanced at baseline, although the comparability at study entry was not proven statistically. The study assessors were not blinded, which might have introduced some assessment bias. A substantial proportion of the patients was lost to follow-up. The sample size was justified on the basis of statistical analyses. The patients were enrolled at a single centre, which might have reduced the representativeness of the patient population. Since clinical data came from patient self-reports, the authors noted that under-reporting might have affected the number of events observed. Another potential drawback of the analysis was that the satisfaction questionnaire was given only to patients who completed the study, thus ‘unsatisfied’ patients who left the study before the end of the follow-up period did not express their preferences. These issues might limit the internal validity of the analysis.

Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because a cost-minimisation analysis was conducted. Please refer to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

Validity of estimate of costs
The analysis of the costs was consistent with the perspective adopted in the study. The unit costs were presented separately from the quantities of resources used for most items. A detailed breakdown of the cost items was reported and quantities of resources used were given. No information on the unit costs was provided. Statistical analyses of the costs were carried out but the cost estimates were specific to the study setting. Only the impact of excluding some cost estimates was investigated. The price year was implicitly reported, which will facilitate reflation exercises in other settings. The source of the data was provided.

Other issues
The authors made few comparisons of their findings with those from other studies. They stated that the particular setting in which the study took place (a semi-rural practice) might limit the generalisability of the study results to other settings. However, it was pointed out that the high non-attendance rates observed in the current study were similar to those reported in other studies. The study referred to adult patients with asthma and this was reflected in the authors’ conclusions.

Implications of the study
The study results support the use of telephone triage to care for adult asthma patients. The authors highlighted the need for further studies to assess the cost-effectiveness of telephone triage in paediatric patients.

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