A comparison trial for stratifying intermediate-risk chest pain: benefits of emergency department observation centers

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
Inpatient and outpatient management strategies for intermediate-risk chest pain (IR-CP) were under evaluation. Patients with IR-CP were transferred from the hospital’s emergency department (ED) to either an ED-based observation centre (ED-OC), an inpatient observation centre (IN-OC), or inpatient units. Patients were placed into the ED-OC or the IN-OC when it was expected that the patient would require only short-term observation in the hospital (usually 24 - 48 hours).

Type of intervention
Other: Management care.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients admitted to hospital with an IR-CP. Chest pain patients who were not admitted as high-risk chest pain, or were discharged as low-risk chest pain after ED evaluation, were designated as IR-CP. Patients discharged with a cardiac diagnosis who did not present with chest pain were excluded from the study population.

Setting
The setting was secondary and tertiary care. The economic study was carried out in Houston (TX), USA.

Dates to which data relate
The effectiveness and resource data were collected from September 1998 to August 2001. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a prospective 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 study.

Study sample
Power calculations were not reported. A total of 3,801 patients with any diagnosis of chest pain were identified at the hospital. Of those, 2,197 (57.8%) patients were declared to have IR-CP and were transferred from the ED to either an
inpatient unit (IN-OC, n=940; inpatient unit, n=763), or to the ED-OC (n=494). The ED-OC and IN-OC patients were further divided into those who were discharged with a diagnosis of chest pain and those who were later admitted to an inpatient unit. Then, five possible dispositions for IR-CP patients admitted through the ED were defined:

ED-OC/ED-OC, admitted to and discharged from the ED-OC (n=441);
IN-OC/IN-OC, admitted to and discharged from the IN-OC (n=746);
ED-OC/inpatient, admitted to the ED-OC and discharged from an inpatient unit (n=50);
IN-OC/inpatient, admitted to the IN-OC and discharged from an inpatient unit (n=194); and
inpatient/inpatient, admitted to and discharged from an inpatient unit without any observation course (n=762).

Study design
This was a prospective cohort study with before and after comparisons. The study was carried out in a single centre. The duration of follow-up was 2 years. Two time periods were defined, 1 September 1998 to 31 August 1999 and 1 September 1999 to 31 August 2000.

Analysis of effectiveness
All the data were collected from the hospital's information systems and accounting computers. The primary health outcomes used in the study were the length of patient stay (LOS), and the number of return visits to the ED for any cardiac etiology at 7 days and/or 6 months after discharge.

The five IR-CP managed groups were not compared in terms of their age and gender profiles. However, the distribution of discharge diagnoses for the patients admitted with IR-CP was similar, with unspecified chest pain as the most likely discharge diagnosis.

Statistical analyses were carried out for comparisons of LOS between groups.

Effectiveness results
The ED-OC reduced the IR-CP admission rate to 11.3% (50 out of 444), while the IN-OC admission rate was 20.6% (194 out of 940).

Over the entire study period, 1 (0.08%) of the 1,190 observation centre patients returned within 7 days with a high-risk diagnosis, compared with 7 (0.70%) of the 1,007 inpatients.

By 6 months, ED-OC had a lower cumulative rate of recidivism than the IN-OC or inpatient units in either time period.

By 6 months, ED-OC had a lower cumulative rate of recidivism than the IN-OC or inpatient units in either time period.

The high-risk return rate was lower in the ED-OC (0.45%) than in the IN-OC or inpatient units in either time period.

IR-CP patients had significantly shorter LOS when managed from either observation centre than when managed from inpatient units (p<=0.001).

The mean ED-OC LOS was 65% shorter than the inpatient LOS and 36% shorter than that of the IN-OC. The mean LOS was 0.75 days (95% confidence interval, CI: 0.72 - 0.78) in the ED-OC, versus 2.16 days (95% CI: 1.32 - 3.00; p<0.001) in the inpatient unit and 1.18 days (95% CI: 1.11 - 1.25; p<0.001) in the IN-OC.

Clinical conclusions
Management in the ED-OC reduced the LOS without jeopardising safety.
Measure of benefits used in the economic analysis
No summary benefit measure was used in the economic evaluation. The study was, in effect, a cost-consequences analysis.

Direct costs
The costs to manage all patients by unit and time period were estimated. The perspective adopted was not reported. The categories of costs included in the analysis were not reported. The authors provided no additional details on the cost analysis. The unit costs and the quantities of resources used were not presented separately. The resource use data were derived using actual data coming from the sample of patients involved in the effectiveness study. Discounting was not relevant since the costs were compared between groups for two time periods of one year. The price year was not reported.

Statistical analysis of costs
Statistical analyses of the costs were carried out, using the parametric Tukey ad hoc test for multiple comparisons and the Mann-Whitney test for non-parametric analysis.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Sensitivity analyses were not performed.

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

Cost results
The total hospital cost for managing the cohort of 984 patients was $2.05 million.

After the ED-OC opened, the mean per patient cost dropped 12.5%, from $2,195 to $1,920.

The comparative mean per patient costs for non-specific IR-CP were significantly lower in both observation centres than in the inpatient units.

The ED-OC costs for IR-CP were 41% lower than in the inpatient unit and 14% lower than in the IN-OC unit.

Synthesis of costs and benefits
A synthesis of the costs and benefits was not relevant, as a cost-consequences analysis was carried out.

Authors' conclusions
Management in the emergency department observation centre (ED-OC) was significantly less costly and faster than any other unit, including the inpatient observation centre (IN-OC).
CRD COMMENTARY - Selection of comparators
The choice of inpatient units as the comparator was explicitly justified, as it represented a standard practice adopted by physicians for IR-CP management. You should decide whether it represents a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The analysis of effectiveness was based on a prospective cohort study. A prospective randomised controlled trial would have been a more appropriate design for the study question. The authors noted that, in the absence of random assignment, selection bias might have occurred. In addition, since the demographic characteristics of the study groups were not compared at baseline, confounding factors may be high. Power calculations were not carried out, and this may represent a main drawback of the analysis. Another main drawback of the analysis was that the estimates were not investigated in a sensitivity analysis. Hence, the robustness of the results was not examined.

Validity of estimate of measure of benefit
No summary benefit measure was derived. In effect, a cost-consequences analysis was conducted.

Validity of estimate of costs
The perspective of the study and the categories of costs included in the analysis were not reported. Details of the unit costs and the quantities of resources used were also not reported, which limits the transferability of the economic analysis to other settings. It is likely that the cost estimates were derived from a single centre and were specific to the study setting. It appears that both charges and costs have been used in the cost analysis. The use of charges limits the generalisability of the results. The date to which the prices related was not reported, which will limit reflation exercises. Discounting was not relevant and was not carried out. Statistical tests of the costs were performed when the cost estimates were compared.

Other issues
The authors compared their results with other published studies, showing similar observations. The authors did not address the issue of the generalisability of the study results to other settings. Sensitivity analyses were not performed to account for variability in the cost or effectiveness data. Consequently, caution should be exercised when extrapolating the study results to different contexts. The results were not reported selectively and the effectiveness conclusions reflected the scope of the study. The authors reported a number of further limitations to their study. More specifically, potential selection biases, no prospective follow-up for return visits, and the exclusion of returns for non-cardiac aetiologies.

Implications of the study
The authors recommended that further studies are conducted to determine the benefits of operating multiple chest pain centres within one institution.

Source of funding
None stated.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
AccessionNumber
22002009246

Date bibliographic record published
31/03/2005

Date abstract record published
31/03/2005