A community hospital-based congestive heart failure program: impact on length of stay, admission and readmission rates, and cost

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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
A comprehensive multidisciplinary care programme for patients hospitalised with congestive heart failure (CHF). The programme was designed according to the guidelines of the Agency for Health Care Policy and Research (AHCPR) and consisted of intensive patient and family education on diet, compliance and symptom recognition. The programme also included outpatient infusion of inotropic agents, and aggressive pharmacologic treatment for patients with advanced CHF.

Type of intervention
Treatment and secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with a primary diagnosis of congestive heart failure.

Setting
Hospital inpatient and outpatient care. The study was carried out in Illinois, USA.

Dates to which data relate
The data for effectiveness and resource use were collected during the period July 1993 to June 1994 for the control group and July 1994 to June 1995 for the programme group. The price year was not reported.

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

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

Study sample
All the patients with primary diagnosis of CHF (diagnosis related group 127) at discharge were included. No power calculations were undertaken to ensure an adequate number of subjects. The number of patients in the control group was 407 and in the programme group was 347. No information on refusals or on exclusion of patients was provided.
Study design
This was a non-randomised controlled trial with historical controls carried out in a single hospital. Patients in the intervention group were followed-up by telephone, as part of the programme, for a minimum of 90 days after discharge. The authors did not report whether any of the patients were lost to follow-up, and hence, did not complete the scheduled treatment.

Analysis of effectiveness
It is not clear whether the intention to treat principle was used in the analysis since the problem of attrition or drop out was not addressed in the paper. The primary outcome measure was length of stay for all CHF-related admissions and the secondary outcomes were the primary admission rate for CHF and the readmission rate within 90 days of discharge. These can be interpreted as proxy measures of the severity of CHF episodes requiring hospitalisation and of the improved management of the disease after discharge. The 20% random sample of subjects was analysed to show that the groups were comparable in terms of mean age, and sex, as well as in terms of various physiological measurement and disease history at baseline. The control group had a higher incidence of previous CHF (76% versus 59%) and intravenous inotropes were administered more to this group during their acute hospitalisation period (31% versus 22%). More patients in the programme group were treated with beta-blockers (12% versus 4%).

Effectiveness results
The mean length of stay in the programme group was 5.7 (+/- 4.8) compared to 7.3 (+/- 5.8) in the control group. This was found to be statistically significant at 0.05 risk level. Also the primary admission and 90-day readmission rates were found to be more favourable to the programme group.

Clinical conclusions
The findings of the study show that a comprehensive heart failure management programme can reduce hospitalisations and improve functional capacity.

Measure of benefits used in the economic analysis
The measure of benefit was mean length of stay for CHF-related admissions.

Direct costs
Costs and quantities were not reported separately. No discounting was needed because the study period was less than 1 year. The analysis was carried out from two perspectives: mean costs per admission represented the patient's viewpoint and the mean (nonreimbursed) revenue lost by the hospital for CHF hospitalisation represented the institution's viewpoint. In both cases the cost boundary was the hospital. No details of the costing methods or the sources were provided, but it is presumed that the estimates were based on the study hospital's own records.

Statistical analysis of costs
Costs were treated stochastically. The statistical significance was determined by Student's t-test, the acceptable risk level being p <=0.05.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.
Estimated benefits used in the economic analysis
Length of stay for CHF-related hospitalisations was found to be 22% (5.7 versus 7.3 days) shorter in the intervention group compared to control group.

Cost results
The mean cost per admission was $6,719 in the control group and $5,601 in the intervention group, indicating a reduction in cost of $1,118 (17%). The lost hospital revenue per hospitalisation was $1,876 in the control group and $535 in the intervention group, reflecting a reduction of $1,341 (71%). In addition, the cost of operating the heart failure centre was reported to be $104,000 per year.

Synthesis of costs and benefits
The cost and benefits were combined. The intervention was found to be better both in terms of length of stay and costs.

Authors' conclusions
A multidisciplinary CHF programme can improve patient care in a community hospital setting while significantly reducing costs to both the patient and the institution.

CRD COMMENTARY - Selection of comparators
No justification was given for the comparator used. The patients in both groups were receiving "maximal conventional therapy", typically including digoxin, loop diuretics, and angiotensin-converting enzyme inhibitors. Hence, this was implied to represent the standard care in the absence of the intervention programme. You, as a user of this database, should consider whether this is a widely used alternative in your own setting.

Validity of estimate of measure of benefit
As the authors acknowledged, the non-randomised design is subject to biases from several sources. Also, the use of utilisation-based proxies for health outcomes may produce misleading results, especially if the proxy used (the length of stay) plays an important role in the measurement of the potential cost savings. The usefulness of such measures is based on the assumption that the discharge criteria are the same for both patient groups, which may not be the case where the study design means that outcomes are measured at different points in time for the intervention and the control group. The authors, however, argue that the decrease is so large that it could not be attributed solely to the overall declining trend in length of stay. More valid information about the improvement in patient outcomes could have been provided by following-up some of the baseline characteristics (e.g. ejection fraction).

Validity of estimate of costs
The costing methods or sources were not described in the paper. No resource quantities were reported. Moreover, it is not clear whether the intervention costs (operating cost of the CHF centre) were included in the mean cost figures reported.

Other issues
It is not clear whether the authors' conclusions are justified given the problems related to the non-randomised study design and the lack of details of the costing. While it seems clear that the CHF programme is profitable from the hospital's point of view there is very little evidence presented in this paper supporting the conclusion about the improved patient outcomes. Also, the overall cost savings both reimbursed and nonreimbursed were not clearly demonstrated. More discussion about the relationship between cost savings (17%) and reduced length of stay (22%) would have been helpful in order to assess to what extent the latter reflects improved patient care rather than just being a key element in cost reduction. The results are highly specific to the study hospital and to the described programme. In the absence of sensitivity analysis and details about the costing any generalising of the results to other settings should be carried out with caution, especially given that the cost analysis from the institution's point of use is highly unlikely to be generalisable outside the US health care system.

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