Heart failure disease management in an indigent population

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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 use of a heart failure multidisciplinary disease management programme (MDMP) for nontransplant indigent patients with heart failure problems. The team consisted of a collaborative practice team of cardiologists, a nurse practitioner who specialised in the care of cardiac patients, a social worker, a cardiovascular pharmacist, a registered dietician and the cardiac rehabilitation team. The intervention consisted of the management of patients with heart failure problems, providing them and their families with a standardised heart failure book, and a comprehensive one-on-one education about symptoms, diet and exercise. In addition, information about medication was reinforced at each visit.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised indigent patients with heart failure who were not transplant candidates. Two different groups of patients were considered at analysis. Group A comprised indigent patients with heart failure who had at least two readmissions per year and an ejection fraction of 45% or less. Group B comprised indigent patients with heart failure referred to the hospital because of their potential for frequent admissions as a result of financial, social or noncompliance issues, who may or may not have had a prior admission. Patients were excluded if they were discharged to a long-term care facility, had severe dementia or other serious psychiatric illness, or had an anticipated survival of less than 3 months.

Setting
The setting was secondary care. The economic study was performed in Albuquerque (NM), USA.

Dates to which data relate
The effectiveness and cost data related to February 1997 to February 1999. The price year was not stated.

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

Link between effectiveness and cost data
The costing was carried out retrospectively on the same study sample as that used for the effectiveness analysis.
**Study sample**

No power calculations to determine sample size were performed in the planning phase of the study. All of the patients admitted to the hospital with a primary diagnosis of heart failure were considered for inclusion in the study because, as the authors stated, the majority of patients seen at this hospital were considered to be indigent patients. In total, there were 225 identified admissions with a principal diagnosis of heart failure. Of these, 18 patients met the inclusion criteria for group A and 21 met the inclusion criteria for group B. Four patients in group A died before the start of the programme, and were therefore excluded from the final sample. This left a final sample of 14 patients in group A. The authors did not show evidence that the study sample was representative of the study population.

**Study design**

The study was a before-and-after study that was carried out in a single centre. The duration of follow-up was one year for each management practice. Four patients from group A died before the start of the programme.

**Analysis of effectiveness**

Not all of the patients included in the study were accounted for in the analysis. The primary health outcomes used in the effectiveness analysis were the New York Heart Association (NYHA) functional class for patients in groups A and B (where a higher class number meant that the patient presented more limitations in their physical activity due to left ventricular failure) and the total number of admissions. These were assessed before and after the implementation of the heart failure MDMP. The percentages of patients receiving angiotensin-converting enzyme inhibitors (ACE-I) and beta-blockers before and after programme implementation were also reported. The baseline demographic characteristics of the groups (e.g. age, gender, ethnicity and education) were also reported. The comparability of the groups was not an issue since this was a before-and-after study for two groups.

**Effectiveness results**

The authors reported baseline values and 1-year outcomes for both groups, A and B. At baseline, 10 patients in group A were NYHA functional class III and 4 were NYHA functional class IV. However, the baseline figures quoted in another table were different. After programme implementation, 12 patients were NYHA functional class II and 2 were NYHA functional class III. The differences between both periods were statistically significant, (p<0.001). The number of admissions within this group decreased from 33 before the implementation of the programme to 3 after its implementation.

In group B, before the implementation of the programme, 10 patients were NYHA functional class II and 11 were NYHA functional class III. Again, different figures were reported elsewhere. After programme implementation, 10 patients were NYHA functional class I and 11 were NYHA functional class II. The differences between both periods were statistically significant, (p<0.001). The number of admissions decreased significantly from 9 in the year prior to the implementation of the programme to zero after the programme was implemented, (p=0.002).

Before the implementation of the programme, 36% of patients in group A and 76% in group B were receiving ACE-I. In addition, 7% of the patients in group A and 38% in group B were receiving beta-blockers. After the programme was implemented, these values were 71% (group A) and 76% (group B) for the administration of ACE-I, and 14% (group A) and 48% (group B) for the administration of beta-blockers.

**Clinical conclusions**

The health state of the patients improved, as shown by the significant improvements in the NYHA functional class and the reduced number of hospitalisations after the implementation of the heart failure MDMP.

**Measure of benefits used in the economic analysis**

There was no summary measure of health benefit in the economic analysis. The study was therefore categorised as a cost-consequences study.
**Direct costs**
The reporting of the costs was very brief. The direct costs considered in the economic analysis were for the hospitalisations and clinical costs, although the authors did not report what kind of costs were considered within this category. Detailed costs were not given. Only the number of admissions and average charges per admission were reported. The source of the direct costs appears to have been the charges from the hospital where the effectiveness analysis was performed. Therefore, the basis of the costing appears to have been actual data. No discounting seems to have been performed, but this was appropriate since the costs were incurred over a one-year period for each of the interventions considered at analysis. The price year was not stated.

**Statistical analysis of costs**
No statistical analyses of the costs were reported.

**Indirect Costs**
No indirect costs were reported.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analyses were reported.

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

**Cost results**
The total costs for hospital admissions before the implementation of the programme were $183,698 in group A and $50,100 for group B.

The authors also reported the net savings of the programme for both groups of patients together. This calculation seemed to equate to the total savings from reduced admissions minus the hospital and clinic charges incurred after the implementation of the programme. These net savings were reported to be $162,000 per year or $4,600 per patient.

**Synthesis of costs and benefits**
Not applicable due to the cost-consequences approach undertaken.

**Authors’ conclusions**
The study demonstrated that patients enrolled in the multidisciplinary disease management programme (MDMP) showed a marked improvement in the New York Heart Association (NYHA) functional class and a decreased number of readmissions to hospital, resulting in net savings.

**CRD COMMENTARY - Selection of comparators**
The management of heart failure patients before the implementation of the MDMP intervention was used as the comparator, because it was current practice before the programme was implemented. However, explicit details of this comparator were not reported. You should consider whether there is a health technology widely available in your own setting for the management of indigent patients with heart failure problems.
Validity of estimate of measure of effectiveness
The analysis used a before-and-after study for two patient groups, which may have been appropriate for the institution that undertook the study. However, there are problems with this type of design. There may not have been any selection bias, but there may have been performance bias since the patients’ improvement may have been partially due to the healing power of time rather than the programme itself. The authors did not provide evidence that the study sample was representative of the study population. Further, the four deaths in group A may have biased the results if their rate of admissions was higher than average. Statistical analyses were not performed to take account of potential biases, but only to show that there were statistically significant differences in the primary health outcomes between the periods before and after MDMP implementation. The authors reported that a limitation of the study was the very small sample size. Since the comparator was not explicitly described, it is hard to say to what the study results were attributable. There seems to have been inconsistencies in the reporting of the results.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The study was therefore categorised as a cost-consequences analysis.

Validity of estimate of costs
The reporting of the costs was very brief, the study perspective was not stated clearly and some important information was not reported, such as the different cost categories included in the economic analysis. Therefore, it cannot be stated with certainty that all of the relevant costs were included. Some relevant costs appear not to have been included in the economic analysis, such as the costs of implementing the heart failure MDMP (e.g. staff-related costs and medication). These costs should have been considered in the economic analysis so that appropriate comparisons of the situation before and after the implementation of the intervention could be made. Charges were used instead of costs, which may not reflect the opportunity costs of the intervention. The resource quantities and the costs were not reported separately, and the price year was not stated. All these factors introduce uncertainty into the reliability of the conclusions and hinder reflation exercises to other settings.

Other issues
The authors made appropriate comparisons of their findings with those from other studies. They showed that, although the study population was different in most of these studies, the results obtained were in accordance with earlier studies. The authors reported that the generalisability of the results was limited since the sample size was very small.

Implications of the study
This study analysed a heart failure MDMP for indigent patients, which did not seem to have been evaluated before. The authors recommended further research in other patient populations and with larger samples in order to evaluate the applicability of the findings.

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None stated.

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