Is multidisciplinary care of heart failure cost-beneficial when combined with optimal medical care?

Ledwidge M, Barry M, Cahill J, Ryan E, Maurer B, Ryder M, Travers B, Timmons L, McDonald K

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
Multidisciplinary care (MDC) in specialised clinics was compared with routine care (RC). Both technologies were supplemented with optimal medical care. MDC consisted of regular patient education and support. Patient education incorporated weight monitoring, disease and medication understanding, and salt restriction. Support comprised nurse-led care on three or more occasions through telephone contact and outpatient clinic visits.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised individuals presenting at casualty with a diagnosis of HF. The patients were at least 18 years of age. Patients presenting with HF in the setting of myocardial infarction or unstable angina, or in whom HF was not thought to be the primary problem, were excluded. Patients with illnesses that could compromise survival for the duration of the study, and those with cognitive impairment, were also excluded.

Setting
The setting was community care via telephone contact and tertiary care through an HF clinic. The economic study was carried out in Ireland.

Dates to which data relate
The effectiveness and resource use data related to patients observed between November 1998 and April 2000. The price year was not reported.

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

Link between effectiveness and cost data
The costing was carried out prospectively on a different sample of patients from that used in the effectiveness study.

Study sample
Some details of optimal medical care were reported elsewhere (see Other Publications of Related Interest). This information was not used to supplement the current abstract. The authors did not report whether power calculations
were used to estimate the influence of chance on the results. The sample was selected by screening all patients over 18 years who were admitted through casualty to St. Vincent's University Hospital, Ireland with a diagnosis of HF. This sample was appropriate for the study question as it included patients with confirmed HF who might benefit from MDC. A total of 214 patients had a confirmed diagnosis, of which 116 were excluded for a variety of reasons. The reasons included nursing home (28 patients; unclear why they were excluded), refused consent (25), cognitive impairment (20), active myocardial ischaemia (16), died in hospital (7), significant visual or hearing impairment (7), living abroad (5), co-morbidity compromising survival (5), immediate value surgery (2), and not English speaking (1). Consequently, 98 patients entered the study, 51 in the MDC group and 47 in the control (RC) group. The average was 70.76 (standard deviation, SD=10.37) years in the MDC group and 70.83 (SD=10.69) years in the RC group. The male-to-female ratios were 32:19 (MDC group) and 33:14 (RC group), respectively.

Study design
This was a prospective, randomised controlled trial. However, no details of the method of randomisation were provided. The study was set in St. Vincent's University Hospital, Ireland, with patients returning to the HF clinic. All the patients were followed for 3 months after their initial discharge. The authors did not report any loss to follow-up. There was no report of any attempts to blind the participants in the study.

Analysis of effectiveness
The analysis was conducted on an intention to treat basis. The primary health outcomes were:

- the number of unscheduled visits,
- the number of days of hospitalisation,
- knowledge of the HF score,
- knowledge of the diet score, and
- the Minnesota living with HF score.

The groups were compared in terms of age, gender, and whether a carer was available, as well as for HF-related variables and aetiology. The authors made no summarising comments and there was no statistical analysis to assesses the magnitude of observed differences.

Effectiveness results
On discharge, knowledge of HF (out of 20) was 16.3 (+/- 2.7) for the MDC group, and 13.1 (+/- 2.2) for the RC group, (p<0.01).

On discharge, knowledge of diet (out of 20) was 8.3 (+/- 2.1) for the MDC group and 6.6 (+/- 1.9) for the RC group, (p<0.01).

At 3 months, there were 2 unplanned HF readmissions in the MDC group (3.9%) compared with 12 in the RC group (25.5%), (p<0.01).

There were 17 days of hospitalisation in the MDC group and 195 days in the RC group.

The Minnesota living with HF score was 29 (+/- 19) in the MDC group and 40 (+/- 23) in the RC group, (p=0.10).

Clinical conclusions
The authors did not draw clinical conclusions independently from the cost conclusions. Nevertheless, MDC gave outcomes consistently preferable to RC.
Measure of benefits used in the economic analysis
The summary benefit measure used was the number of hospitalisations prevented.

Direct costs
The costing was carried out from the perspective of the health care provider. As such, it centred on the costs of implementing the MDC programme. The cost of MDC was calculated as direct scheduled and unscheduled patient contact time with specialist nurses and dieticians, and was based on average salaries. The physician staff costs were calculated on the basis of an annual register of Ireland. The daily cost for HF hospitalisation was taken from the National Centre for Pharmacoeconomics. This covered ward costs, laboratory tests, procedures, medications and ambulance costs. Discounting was not necessary as the timeframe was only 3 months. The unit costs were reported separately but a price year was not reported. The quantities were measured during the course of the trial. The authors did not include cost-differences due to medication, and medication differences were later found to be statistically insignificant.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not included, as the authors provided evidence that the major cost of HF care was hospitalisations.

Currency
Euros (Euro).

Sensitivity analysis
Sensitivity analyses were carried out to assess the impact of a 50% variation in the costs. The limit appears to have been arbitrary. The type of analysis, one-way or two-way, was not reported.

Estimated benefits used in the economic analysis
Ten hospitalisations were prevented using MDC.

Cost results
The cost of hospitalisations was Euro 47,190 for RC and Euro 4,114 for MDC. The MDC intervention cost Euro 5,860.

Synthesis of costs and benefits
The net saving was presented as the total cost of RC hospitalisation that would be saved by using MDC, less the cost of MDC hospitalisations and the cost of MDC intervention. This gave a net saving of Euro 37,216.

The total intervention cost of the MDC team was Euro 5,860 and there were 10 fewer hospitalisations. Therefore, the cost-savings from reduced hospitalisations was Euro 586 per hospitalisation prevented.

The sensitivity analyses demonstrated that variations in the costs led to a difference in RC and MDC costs of between Euro 8,634 and Euro 65,798.

Authors' conclusions
Multidisciplinary care (MDC) of heart failure (HF) is cost-beneficial, even when medical therapy is optimised and the event rates are consequently low.

**CRD COMMENTARY - Selection of comparators**
The authors compared MDC and optimal medical care with a control group that received RC and optimal medical care. They justified this choice with a discussion that other studies had not explicitly stated that optimal medical care was used, and that this may have altered the cost-effectiveness. The extent to which optimal medical care is used in practice was not apparent. Therefore, the generalisability of the results to everyday care is unclear. Using RC as the comparator shows the active value of the intervention, although other well-established therapies (such as angiotensin-converting enzyme inhibitors, diuretics and beta-blockers) might have been considered as viable comparators.

**Validity of estimate of measure of effectiveness**
The analysis was based on a prospective, randomised controlled trial, which gives the study high internal validity. However, further details on the method of randomisation could have been presented. The study sample comprised individuals presenting with a diagnosis of HF, thus it was representative of the study population. Summary statistics were presented for the two groups at analysis and the groups were demonstrated to be comparable over a wide range of variables. However, the authors could have used statistical analyses such as a comparison of differences using confidence intervals and p-values to show the extent of differences. Further details of how the Minnesota living with HF score was assessed would have helped readers to assess the generalisability of these quality of life valuations.

**Validity of estimate of measure of benefit**
The measure of benefit, hospitalisations prevented, was obtained directly from the effectiveness analysis. It seems to have been a natural summary measure. If the Minnesota living with HF score could be converted in to a measure of quality-adjusted life-years, then a more comparable cost-effectiveness measure might have been derived.

**Validity of estimate of costs**
The costs were estimated from the perspective of the health care provider. From this perspective, all the hospital and medical costs should have been included. However, the authors acknowledged that medical costs were not included. They justified this action through the statistically non significant differences in medical costs between the two groups. Whilst justified, and therefore appropriate in this instance, readers should be careful not to estimate a budgetary impact for the health care provider based on these results, as they do not include all the relevant costs. The large difference between the costs of hospitalisation for the two groups suggests that small omissions in cost (e.g. the medical costs excluded) are unlikely to affect the principal conclusions drawn. The unit costs were reported separately, thus allowing the reader to reassess the cost results and potentially apply estimates to their own setting.

**Other issues**
The authors made appropriate comparisons of their findings with those from other studies and highlighted alternative population groups as the main source of differences. They also pointed out that no other study had focused on the benefit of MDC independently of optimal medical care. Therefore, no direct comparisons could be made. The issue of generalisability to other settings was explicitly addressed with a discussion of the caveats that must be borne in mind, such as setting up MDC costs that might be required elsewhere. The authors did not present their results selectively. The study enrolled patients with a low likely event rate and this was reflected in the authors’ conclusions. It was also suggested that this made the results conservative in comparison with the general population. A number of limitations were discussed. For example, the transfer of hospital costs between studies and the decision to exclude the indirect costs.

**Implications of the study**
The authors suggested "the intensive approach to MDC and medical management should become the standard of care for HF". They also suggest that the benefits of the education and support programme beyond 3 months would be of
interest for further work.

Source of funding
Supported in part by unrestricted grants from the Irish heart Foundation and Servier Laboratories, Ireland.

Bibliographic details

PubMedID
12798838

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Aged, 80 and over; Angiotensin-Converting Enzyme Inhibitors /administration & dosage /economics; Cost-Benefit Analysis /economics; Decision Making; Digoxin /administration & dosage /economics; Diuretics /administration & dosage /economics; Dose-Response Relationship, Drug; Female; Furosemide /administration & dosage /economics; Health Care Costs; Heart Failure /diagnosis /economics /therapy; Hospitalization /economics; Humans; Ireland; Length of Stay /economics; Male; Middle Aged; Perindopril /administration & dosage /economics; Prospective Studies; Time Factors; Ventricular Dysfunction, Left /diagnosis /economics /therapy

AccessionNumber
22003000934

Date bibliographic record published
31/12/2004

Date abstract record published
31/12/2004