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Cost effectiveness of personal health education in primary care for people with angina in the Greater Belfast area of Northern Ireland

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Abstract

***Study objective* – To investigate the cost effectiveness of personal health education for angina patients being treated in general practice.**

***Design* – A randomised controlled trial in which people were randomised to intervention and control groups. All were assessed at the start and end of the study, with details recorded of disease status, coronary heart disease risk factors, and self assessed quality of life. A note was taken of their current use of drugs and over the course of the study their use of all health services. Those in the intervention group had three visits per year from a health visitor, whose brief was discuss ways of living more easily with their disease and in which risks of further events might be reduced.**

***Patients* – Altogether 688 patents in the Greater Belfast area aged less than 75 years and known to have angina for at least six months.**

***Main results* – Significant improvements in survival and self assessed quality of life were found between the study and control groups. The intervention was associated with a reduction in drug usage and there was no significant difference between the intervention and control groups in terms of their use of other health services.**

***Conclusion* – Given the improvement in survival and self assessed quality of life and no significant differences in costs to the health service between the two groups, the intervention was deemed to be cost effective.**

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The aim of this study was to investigate the cost effectiveness of nurse led personal health education for people with angina being cared for in general practice. Intuition suggests that the most effective health promotion interventions are likely to be for relatively young people, so that it is possible to prevent disease or to take effective action at an early stage in its progression. However, recent studies have questioned this. In many cases the most cost effective interventions are likely to be for relatively older people who already have symptomatic disease.[1 2]

There are two reasons why this may be the case. Firstly, if the focus is on those who already have symptoms, it is easy to identify them without complex screening and confirmation tests. All the effort goes on trying to modify the behaviour of those for whom such change is very likely to bring benefits. It therefore allows very efficient targeting of the interventions. With other forms of targeting it is difficult to ensure that the programme concentrates on those with greatest potential to benefit. Secondly, those with symptomatic disease are likely to be more motivated than those for whom the increased risk of an adverse event is not accompanied by any obvious ill health. For any given change in behaviour the cost is therefore likely to be lower.

There is some evidence that it is possible to modify lifestyles significantly for patients with coronary artery disease,[3] but it is not clear that this can be accomplished in routine practice. The study reported here used an intervention that is relatively cheap and simple and could be easily replicated elsewhere. More detail of the trial and the clinical outcomes have been reported.[4]

Methods

The study was a randomised controlled trial in which 688 people were randomised between the intervention and control groups. All participants were assessed at the start and end of the study, with details recorded of disease status, coronary heart disease risk factors, and self assessed quality of life, and a note was taken of their current use of drugs. Those in the intervention group had, in addition, three visits per year from a health visitor. The health visitor's brief was to discuss ways to live more easily with their disease and ways in which risks of further events might be reduced.

The effect of the intervention on the health status of patients might be evidenced through changes in lifestyle or in their use of health services. Since most services are provided free to patients, the cost of any increase in use falls on the health service. It was therefore decided to record the quantities and types of services used as well as the health status of patients in the two groups. Those health services examined were:

(1) Prescription of drugs;
(2) Visits to the GP;
(3) Visits to the hospital as inpatients or outpatients;
(4) All tests, investigations and treatments carried out.

A vector of costs, to translate these activity data into a single measure of cost for each patient was devised. This was done by surveying all

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Table 1 Comparison of drug and services costs for the intervention and control groups

Element of cost	Control group (£)	Intervention group (£)	Difference significant at 5% based on Z tests
Drugs before	190.13	287.26	—
Drugs after	193.05	260.02	—
Drug difference	− 7.81	− 20.40	No significant difference
Procedures	1762.82	1819.32	No significant difference
Health visitor	0.00	24.86	

Table 2 Comparison of overall service costs for the intervention and control groups

Element of cost	Control group (£)	Intervention group (£)	Difference significant at 5% based on Z tests
All costs	1811.88	1851.18	No significant difference

hospitals to which referrals were made to establish any costs associated with hospital treatment; examining for each individual the specific type and dosage of drugs used and determining the appropriate costing from *MIMS*.[5] The cost of GP visits was calculated from the data collected in the ongoing OXCHECK cost effectiveness study.[1] The information on the costs of the intervention (that is, visits by the health visitor) was taken from health service costings current at the time of the study. It was not possible to exclude the research costs such as additional time spent by the health visitor in recording and data collection. Community care costs were omitted from cost calculations, and service costs are, as a result, underestimated in the study. However, there seems no reason to expect that use patterns between groups for those services will differ from those of other services. In consequence, their exclusion should not bias the cost effectiveness comparison. Rather, costs for the two groups for whom the comparison was made will be equally underestimated.

Results

The direct cost of the visits by health visitors per year was calculated at £13.61 for staff time and £11.25 for travel related costs. The visits therefore had a total cost of £49.72 for each patient over the two years of the study.

Patients in the study were inevitably heavy users of drugs and health services. Despite being randomly allocated to the intervention and control groups, the cost of drugs for the control group at the start of the study (mean (SD), £190.13 (£154.51)), was significantly lower than for the intervention group (£287.26 (£300.17)).

Table 1 compares the various elements of costs associated with services to patients in the study. These comprised drug costs, the changes in drug costs, the intervention costs and the cost of services and procedures provided for patients. It should be noted that the calculation of changes in drug costs is based on the change that took place for patients for whom there were data at the start and end of the study. This means that it is not exactly the same as the difference between the means.

Since patients were not questioned in detail about services they had used before the study period it was not possible to assess directly the change in service use for the intervention and control groups, although the use of services during the study period for each group was recorded. Any difference between the use of health services by the intervention and control groups might be interpreted as the effect of the intervention.

In this case no statistically significant difference was found, so it is not possible to reject the hypothesis that service use was the same for both groups.

The cost of the intervention and its associated drug and health services costs can be calculated from the difference between the health services costs for the intervention and control groups, the change in drug use resulting from the intervention and the direct cost of the intervention. Table 2 shows that there is no significant difference between the overall costs for the intervention and control groups. Any benefits of the intervention are therefore probably achieved at no net cost. On the basis of this study, the intervention is therefore clearly cost effective since significant benefits are achieved without cost.

Discussion

This intervention has been shown in the trial to have a significant impact on survival[4] and self assessed quality of life for people with angina cared for in general practice.[6] The direct costs of the intervention are small, although this patient group inevitably contains many people who are large users of drugs and services. The costing applied to the intervention includes costs associated with time spent by the health visitor in recording data directly related to the research protocol. This would slightly inflate the cost associated with this intervention as part of a research programme in comparison with a normal service programme. However, it should not be forgotten that there is always a risk that researchers in a study of this type may provide some hidden support which would reduce service costs which might otherwise have been required and would counter balance this.

It is good practice in carrying out cost effectiveness studies alongside randomised controlled trials to look at differences in the use of all health services in making comparison of costs. This is because of the difficulties associated with determining the indirect effects of any intervention upon other elements of demand - for example, other illnesses detected and treated because of the intervention. In deter-

mining costs, no attempt was made to distinguish between different reasons, for example, for visiting GPs. The risk was that these benefits might have been achieved only with a large increase in use of health services, since treatable disease which might otherwise not have been presented by patients might have been identified by the health visitors. However, no difference in cost has been detected. While a component of cost (namely community care cost) was omitted from the study for those elements of cost covered, no difference in cost has been detected.

The variance of the costs of drugs and procedures, tests, and investigations for patients in this study (both intervention and control groups) is large, which implies wide variations in prescribing and management patterns for these patients. This observation suggests that further work on the use of resources in this area of health care would be of value.

In this study, the effectiveness was assessed in terms of differences in survival, self assessed quality of life, and coronary heart disease symptoms and risk factors.[4] No attempt has been made to combine these into a single utility measure. From the results it would in principle be possible to calculate years of life gained, but this would require modelling of likely future events for the two groups.[2]

This intervention is cost effective since it generates useful benefits at no detectable cost to health services. As has been shown elsewhere,[1] cost effective interventions for coronary heart disease are often found in services for relatively older people with established disease. This study identifies another example of this. When benefits can be achieved without cost, such services should be given top priority in development of health services.

1 Field K, Thorogood M, Silargy M, Normand C, O'Neill C, Muir J. Strategies for coronary risk factor prevention in primary care: Which is most cost effective? *BMJ* 1995; **310**:1109-12.
2 Mangtani P, Hall A, Normand C, The cost effectiveness of hepatitis B vaccination strategies in England and Wales. *J Epidemiol Community Health* 1995;**49**:238-44.
3 Thompson SC, Schwankovsky L, Pitts J. Counselling patients to make lifestyle changes: The role of self-efficacy, training and beliefs about causes. *Family Practice* 1993; **10**:70-5.
4 Cupples ME, McKnight A. Randomised controlled trial of health promotion in general practice for patients at high cardiovascular risk. 1994 *BMJ*;**309**:993-6.
5 *Monthly index of medical specialities*. London: Haymark Medical Ltd, July 1993.
6 Cupples ME, McKnight A, O'Neill C, Normand C, The effect of personal health education on the quality of life of patients with angina in general practice.*Health Education Journal* 1996;**4**:75-83.