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Mixed method evaluation of an innovation to improve secondary prevention of coronary heart disease in primary care

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ABSTRACT

Secondary prevention of coronary heart disease (CHD) is high on the primary care agenda, but the evidence base for targeted interventions to improve the quality of services in this area is patchy. This article reports an evaluation of an innovative project aiming to improve secondary prevention in an area of social deprivation. The innovation was based in one primary care trust (PCT), and funded by the voluntary sector.

Three distinct approaches to the evaluation are reported: a before and after audit of services, a survey of patient-reported uptake of services, and qualitative data from staff interviews.

Taken together, the evaluation showed a picture of improved services in intervention practices compared with controls. Against a background of increasing quality of systematic care for CHD, following the introduction of the National Service Framework, intervention practices showed greater gains than control practices. Furthermore, two-thirds of practices that benefited from the innovation reported offering some form of cardiac rehabilitation service locally. Patients in intervention practices were more likely to report appropriate monitoring and treatment for cholesterol management, and were more likely to receive lifestyle advice. Staff interviews revealed the mechanisms by which such improvements had been facilitated.

This evaluation suggests that interventions based at PCT level can facilitate changes in a number of practices in a locality. This model of service delivery might be particularly beneficial in areas of social deprivation where staff are dealing with high levels of disease, and improvements can lead to reductions in health inequalities. The conclusions are qualified, however, by the difficulty in conducting rigorous evaluations of complex innovations against a background of constant change and national and local initiatives.

Keywords: coronary heart disease, evaluation, secondary prevention

Introduction

Improvements in the quality of care demands constant evaluation of innovations, whether in technology or in service delivery. Where innovations are time limited and funded by charitable organisations, it is particularly important that local health services are able to evaluate their effectiveness before 'mainstreaming' such developments in future planning. This paper presents the results of an evaluation of an innovation funded by the British Heart Foundation (BHF).

Secondary prevention strategies have the potential to reduce mortality and the risk of further ischaemic events in patients with established coronary heart disease (CHD), however there is recent evidence that this care may remain suboptimal.[1,2]

A number of well-designed randomised controlled trials have reported on the impact of targeted secondary prevention in primary care.[3–7] These studies, using a variety of intervention strategies, have had mixed results and there is a need for continued investigation into the identification of an optimal strategy for the organisation and delivery of such services.[8–10]

The BHF-funded initiative reported here aimed to improve the provision of secondary prevention services for those with established CHD in an area of significant deprivation. Box 1 gives a summary of the initiative, which provided funding for two part-time facilitators, one nurse and one exercise worker, to work with primary care staff in the intervention practices over a two-year period (1999–2001). The project staff did not themselves give care, but provided resources, advice and training for general practitioners (GPs), practice nurses and staff from recreation and leisure services. The nurses worked directly with practice nurses (PNs) and GPs to develop their skills in identifying and monitoring patients with CHD, giving lifestyle advice, and ensuring optimum medication regimes. The exercise worker worked with both GP practices and the community at large to identify and facilitate the provision of exercise facilities suitable for CHD patients. The project was conceived before the publication of the National Service Framework (NSF) for CHD, and operated over the first years of its introduction.

The community in which the intervention took place has high mortality rates for CHD, and high levels of deprivation.[11] The 11 GP practices that were the subject of the initiative were all contained within one newly formed primary care trust (PCT), and had worked together previously as part of a purchasing project. Townsend deprivation scores for the intervention practices ranged from –4.3 to 4.7, with a mean score of 1.1. The practice populations contained few ethnic minorities.

Box 1 Description of the project being evaluated

- British Heart Foundation (BHF)-funded initiative over two years (1999–2001)
- Aimed to improve secondary prevention of CHD among 11 GP practices in an area of deprivation
- Aimed to improve liaison between primary and secondary care for acute myocardial infarction (AMI) patients
- Funded one nurse and one exercise worker as project workers, both working part-time for the duration of the project
- Role of project workers was to facilitate better care by primary care staff, rather than to give direct care themselves

Design of the evaluation

Although the BHF initiative was targeted at 11 practices, the formation of a PCT at that time allowed some of its effects to be dispersed to neighbouring practices. In order to assess the effectiveness of the intervention in improving secondary prevention, therefore, a second PCT in the same city was recruited to act as a control. Eleven practices in the control PCT were selected for comparison purposes, matched as far as possible on deprivation indices with the intervention practices.

The evaluation used a variety of methods, three of which related to services offered for secondary prevention:

- an audit of CHD services available in intervention and control practices, before and after the BHF project
- patient-reported provision and uptake of services for secondary prevention in intervention and control practices
- staff perceptions of the benefits of the BHF project.

Thus the evaluation was able to test the outcomes of the BHF project from a variety of perspectives, providing an element of triangulation. The use of a control group was particularly important as the project took place against a background of other changes, such as the implementation of the newly published NSF,[12] the establishment of PCTs, and various initiatives funded under a Health Action Zone.

The methods and results of each of these elements of the evaluation are described in turn briefly below. Data collection took place between 1999 and 2001.

Audit of provision of CHD services available in participating practices

A data collection tool based on the draft CHD NSF was developed and piloted for use as a questionnaire survey to participating practices. The baseline audit took place in August 1999 and the second survey in October 2001, at the end of the BHF project. Questionnaires with letters of support were mailed to practice CHD leads to complete. Non-responders received reminders. Both surveys received high response rates (see Table 1).

Numbers in the sample of practices were too small to test for statistical significance. Therefore, the impact of the project was inferred from the change in responses reported by practices in 2001 compared to the baseline survey. Key survey findings are shown in Table 2.

Table 1 Survey response rates

	1999 response (%)	2001 response (%)
Control practices	10/11 (91)	8/11 (73)
Intervention practices	11/11 (100)	10/11 (91)

Table 2 Key findings of 1999 and 2001 surveys of provision of CHD services in intervention and control practices

Question	Practice	Number of practices responding 'Yes'	
		1999	2001
CHD data collection			
1 Does your practice have established protocols/guidelines for the identification of people with established CHD?	Intervention Control	3/11 7/10	9/10 7/8
2 Does your practice have an age-sex register of all CHD patients?	Intervention Control	11/11 9/10	9/10 8/8
3 Does your practice routinely collect smoking status data on CHD patients?	Intervention Control	9/11 10/10	9/10 8/8
4 Does your practice routinely collect cholesterol level data on CHD patients?	Intervention Control	6/11 8/10	9/10 8/8
5 Does your practice routinely collect blood pressure data on CHD patients?	Intervention Control	10/11 10/10	9/10 8/8
6 Does your practice routinely collect body mass index data on CHD patients?	Intervention Control	8/11 10/10	9/10 7/8
7 Can your practice identify CHD patients who are prescribed statins?	Intervention Control	7/11 10/10	9/10 8/8
8 Can your practice identify CHD patients who are prescribed beta-blockers?	Intervention Control	7/11 9/10	9/10 8/8
9 Can your practice identify CHD patients who are prescribed ACE-inhibitors in heart failure?	Intervention Control	4/11 8/10	7/10 7/8

continued

Question	Practice	Number of practices responding 'Yes'	
		1999	2001
10 Are you able to determine how many of your CHD patients have blood pressures maintained below 140/90 mmHg?	Intervention Control	2/11 4/10	7/10 4/8
11 Are you able to determine the number of CHD patients who have had their cholesterol lowered to less than 5 mmol/l and LDL below 3 mmol/l or by 30%?	Intervention Control	1/11 3/10	5/10 4/8
CHD secondary prevention			
12 Does your practice have agreed protocols/guidelines for referral of newly diagnosed and/or worsening angina patients to see a specialist?	Intervention Control	7/11 2/10	9/10 3/8
13 Does your practice have agreed protocols/guidelines for referral of patients with suspected heart failure?	Intervention Control	2/11 2/10	6/10 3/8
14 Does your practice have any established structured/ systematic care protocols for secondary prevention of CHD?	Intervention Control	4/11 5/10	9/10 7/8
Cardiac rehabilitation			
15 Does your practice offer a cardiac rehabilitation service in addition to the routine follow up of patients with an acute cardiac event?	Intervention Control	0/11 0/10	7/10 0/8
16 Does your practice offer a cardiac rehabilitation service that includes an exercise programme?	Intervention Control	0/11 0/10	4/10 0/8
17 Does your practice offer a cardiac rehabilitation service that includes psychological support?	Intervention Control	0/11 0/10	7/10 0/8
18 Does your practice offer a cardiac rehabilitation service that includes social support?	Intervention Control	0/11 0/10	6/10 0/8
19 Does your practice offer a cardiac rehabilitation service that includes dietary advice?	Intervention Control	0/11 0/10	7/10 0/8

Improved compliance with NSF guidelines on practice data collection was evident after the BHF project in several areas, including established protocols for identification of people with CHD, ability to identify patients prescribed statins, beta-blockers and angiotensin converting enzyme (ACE) inhibitors, and ability to monitor blood pressure and cholesterol compliance (see Table 2). In all these areas the intervention practices showed improvements from baseline, whereas control practices showed a static or deteriorating position.

Both intervention and control practices showed improvements in secondary prevention services during the two-year period, but intervention practices showed somewhat greater gains than controls. The greatest change was observable in cardiac rehabilitation provision, with seven of the 11 responding intervention practices offering such a service after the BHF project, whereas none had done so before. None of the control practices offered cardiac rehabilitation before or after the project.

Patient-reported provision and uptake of services for secondary prevention

A postal questionnaire survey of 1522 patients was conducted for this element of the evaluation. The sample was selected at random from the CHD registers of the 16 GP practices that agreed to participate. A total of 1044 responses were received (69%). Of these, 428 were from intervention practices and 616 from control practices (61% and 75% respectively). Data were analysed by comparing responses from intervention and control group practices, and testing for significant associations using the chi-squared test for categorical variables.

Questions asked related to influenza vaccinations, blood pressure checks, cholesterol tests and lifestyle advice received during the previous year. Respondents were also asked to report the drugs they were taking. Influenza vaccination was reported by 72.3% of the respondents, with no significant differences between the groups. Blood pressure checks were reported by 96% of the intervention group, and 93% of the control group. The difference was not statistically significant. Cholesterol tests were reported by 77.8% of the intervention group, and 72.5% of the control group; this difference was statistically significant ($P = 0.002$).

Self-reported drug prescriptions were very similar for the two groups, but significant differences were found between control and intervention groups for beta-blockers and for statins. Beta-blockers were more likely to be taken by patients in the control group (40.4% compared with 31.3%, $P = 0.003$), but statins were more likely to be taken by patients in the intervention group (50.9% compared with 44.2%, $P = 0.031$).

Healthy lifestyle advice reported by patients is shown in Table 3. Over the last two years, patients from intervention practices were significantly more likely to report advice about diet ($P = 0.021$), exercise ($P = 0.001$) and smoking ($P = 0.049$) than patients from control practices.

Changes in lifestyle during the last two years were reported by 52% of the whole sample. Dietary changes had been made by 80% of the sample, and exercise changes by 29%, but there were no significant differences between the two groups for these variables. When asked about changes in smoking behaviour, however, there was a statistically significant difference between the groups; 27.1% of patients from intervention practices had made a change in smoking habits, compared with only 19.4% of patients from control practices ($P = 0.041$).

Staff perceptions of benefits from the BHF project

Staff experiences of the intervention were gathered using a qualitative approach. Semi-structured interviews were conducted with four GPs and 14 PNs by one of the research team. The staff interviewed

Table 3 Lifestyle advice received by CHD patients in the last two years

Patients from	Received advice about		
	Diet (%)	Exercise (%)	Smoking (%)
Intervention practices	215/396 (54.3)	163/363 (44.9)	106/334 (31.7)
Control practices	266/569 (46.7)	184/538 (34.2)	129/506 (25.5)
Total	481/965 (49.8)	347/901 (38.5)	235/840 (28)

represented 18 practices in all, 13 of which were from the intervention PCT, and four from the control PCT.

There was widespread agreement amongst the PNs in the intervention group that the support from the project, particularly from specialist nurse, had been valuable. The support had been felt in three ways: practical help, for example in developing IT skills needed to establish and use CHD registers, support gained from the accessibility of a fellow professional to answer questions and act a resource, and as a 'trigger' for a range of developments that had taken place following the establishment of the project. While not directly attributed to the project, there were several examples of developments taking place in the intervention practices that have been supported by the project workers, including smoking cessation groups, and 'health walks' arranged by the practice.

In addition, some interviewees in the intervention group reported that communication between primary and secondary care, which some GPs and PNs had reported to be unreliable, had been facilitated by the project through the expansion of a nurse-to-nurse referral system.

The GPs interviewed particularly supported the development of nurse-led clinics and felt that this was the only realistic way of developing secondary prevention services. Confidence in the PN role was expressed by all the GPs interviewed. The PNs expressed enthusiasm for the increased responsibility of nurse-led clinics, although this was tempered by some concerns about accountability and the need for clear protocols, appropriate education and GP support. There was also support from both GPs and PNs for the development of community-based cardiac rehabilitation services, acknowledging the resource implications of such a development.

The full report of this component of the study is published elsewhere.[13]

Discussion

This project and its evaluation took place against a background of changing and improving services for CHD in response to national policy as expressed in the NSF. Over and above this, however, some changes can be seen that can be attributed to the BHF project. Taken together, the three elements of the evaluation present a picture of improving services in intervention practices compared to the control practices. Compared to baseline, the audit of services suggests that overall more intervention practices reported providing structured systematic care and secondary prevention services for CHD patients. Although a similar observation was noted for control practices, the change did not appear to be as marked as that with the intervention practices. However, the differences in responses to the questions in the two surveys were not statistically significant because of small numbers. After the BHF project, two-thirds of responding intervention practices reported offering a cardiac rehabilitation service.

Services for secondary prevention and lifestyle advice as reported by patients were significantly improved in intervention practices. Patients in these practices were more likely to report checks for high cholesterol, and were more likely to be prescribed statins. More patients in intervention than control practices reported advice given on diet, exercise and smoking, and more reported change in their behaviour in relation to smoking.

Lastly the interviews with staff in the intervention practices revealed how some of this improvement might have been achieved. The BHF project was able to provide practical support for PNs in developing technical skills and monitoring systems, and was a motivational force in triggering the development of innovative CHD services.

As a result of funding and time constraints, this evaluation was limited in several ways. Firstly the choice of control PCT was dictated by the local pace of change in primary care reorganisation. This resulted in less than ideal matching of intervention and control practices, in terms of deprivation. Secondly the baseline audit of services had already been done before the start of the formal evaluation, resulting in slightly different methodologies being employed at different stages of the audit. This difficulty was caused by lack of availability of funding for the evaluation until after the start of the innovation. However, care was taken to follow the method of the baseline audit wherever possible in the follow-up.

The new UK General Medical Services Contract confirms the importance of providing high-quality CHD secondary prevention services in primary care.[14] It includes funding to encourage general practices to implement such evidence-based care and enables PCTs to commission enhanced services to meet local health need. In the demanding context of primary care in areas of deprivation, and with the multiple and competing agendas of chronic disease management, the findings of this evaluation suggest that a dedicated resource at PCT level for one particular priority – in this case secondary prevention of CHD – can make a significant contribution to the local practice's provision of care. Such innovations, however, are difficult to evaluate by a single method, and require multiple approaches to assess their impact. In addition, the background of constant change driven by national and local initiatives requires that any evaluation must be designed with an element of control to ensure confounding does not occur.

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CONFLICTS OF INTEREST

None.

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