Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial

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Abstract

Objective To evaluate a smoking cessation intervention that can be routinely delivered to smokers admitted with cardiac problems.
Design Randomised controlled trial of usual care compared with intervention delivered on hospital wards by cardiac rehabilitation nurses.
Setting Inpatient wards in 17 hospitals in England.
Participants 540 smokers admitted to hospital after myocardial infarction or for cardiac bypass surgery who expressed interest in stopping smoking.
Intervention Brief verbal advice and standard booklet (usual care). Intervention lasting 20-30 minutes including carbon monoxide reading, special booklet, quiz, contact with other people giving up, declaration of commitment to give up, sticker in patient's notes (intervention group).
Main outcome measures Continuous abstinence at six weeks and 12 months determined by self report and by biochemical validation at these end points. Feasibility of the intervention and delivery of its components.
Results After six weeks 151 (59%) and 159 (60%) patients remained abstinent in the control and intervention group, respectively (P=0.84). After 12 months the figures were 102 (41%) and 94 (37%) (P=0.40). Recruitment was slow, and delivery of the intervention was inconsistent, raising concerns about the feasibility of the intervention within routine care. Patients who received the declaration of commitment component were almost twice as likely to remain abstinent than those who did not receive it ($P < 0.01$). Low dependence on tobacco and high motivation to give up were the main independent predictors of positive outcome. Patients who had had bypass surgery were over twice as likely to return to smoking than patients who had had a myocardial infarction.
Conclusions Single session interventions delivered within routine care may have insufficient power to influence highly dependent smokers.

Introduction

Smoking cessation after myocardial infarction is associated with a significant decrease in mortality and morbidity.[1–3] Several studies have examined the efficacy of interventions to help cardiac patients to give up smoking and have reported moderate to good results.[4–8] So far, however, only relatively intensive interventions delivered by dedicated staff have been studied. In the context of the UK health service, effective interventions are needed which can be delivered routinely and on a large scale by existing staff. Such interventions should not impose a large additional workload or require substantial new resources.

The first few days after a cardiac event or after bypass surgery may provide a unique opportunity for an intervention aimed at preventing a return to smoking after discharge. We evaluated such an intervention implemented by cardiac rehabilitation nurses during their routine work.

Method

Participants—The study took place in 17 hospitals in England. Patients admitted after myocardial infarction or for coronary bypass surgery were screened for eligibility. Participants were current smokers or those who had recently stopped smoking. Patients were invited to take part if they had recovered enough to receive the intervention, had no gross memory impairment, were under 76 years of age, could read English, had not smoked at all since admission to hospital, and were motivated to stop smoking permanently. A sample of 244 participants in each group would give a 90% probability of detecting a 15% increase in abstinence rates and 80% probability of detecting a 13% difference ($\alpha = 0.05$, two tailed test).

Procedures—The cardiac rehabilitation nurses recruited eligible patients on wards. Participants signed the consent form, filled in the study questionnaire, and were randomised to the intervention or control group. All participants in the control group received verbal advice to remain abstinent and a British Heart Foundation booklet *Smoking and Your Heart*. Participants in the intervention group were also to receive a carbon monoxide reading to show the health benefits of quitting; a booklet on smoking and cardiac recovery that challenged the belief that smoking alleviates stress and provided advice on avoiding relapse; a written quiz on the contents of the booklet, which was subsequently discussed with the nurse, to improve retention and understanding of the information; an offer to be put in contact with another cardiac patient who had also recently stopped smoking to provide mutual support (a "buddy")[9]; and a declaration of commitment not to smoke to sign and keep as a motivational reminder. A sticker was placed on their notes as a reminder to the staff to reinforce the intervention at future contacts.

Outcome measures—We defined participants as being continuously abstinent if they reported that they had smoked no more than five cigarettes (or "roll-ups," cigars, or pipes) since recruitment and had not smoked at all in the past week. They also had to have an expired carbon monoxide reading < 10 ppm and, at 12 months, a salivary cotinine concentration < 20 ng/ml. Nurses recorded their own compliance with individual study procedures by ticking the intervention elements listed on the form. They also noted the duration of the intervention. Patients recorded their recall of the intervention by ticking items on a self completed questionnaire at the six week follow up.

Editorial by West

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Table 1 Baseline characteristics of participants admitted to hospital after myocardial infarction or for bypass surgery

	Control (n=266)	Intervention (n=274)
Men	207	210
Mean (SD) age (years)	56 (10)	56 (10)
Married/living with partner	184	194
No educational qualifications	171	177
In paid employment	116	110
Retired	86	96
Myocardial infarction	253	252
Bypass surgery	13	22
Mean (SD) time since admission/operation (days)	4.6 (3.4)	4.9 (4.6)
Stopped smoking before hospital admission	68	75
Mean (SD) No of cigarettes/day	21.1 (11.4)	22.6 (13.0)
Mean (SD) minutes to first smoke in morning	45.7 (107.5)	42.1 (96.9)
Thought smoking made condition worse	231	233

Follow up—Data at the six week follow up were collected by nurses at the time of the routine hospital visit after discharge, or patients were visited at home. At 12 months participants were telephoned. If they said they had stopped smoking a home visit was arranged to collect a carbon monoxide reading and a saliva sample for cotinine analysis.

Data analysis—We assessed the effect of the intervention with χ^2 tests and 95% confidence intervals and multiple logistic regressions to control for possible confounding variables. All P values are two tailed.

Results

There were no differences between the intervention and control groups in any of the baseline characteristics (table 1).

Smoking cessation rates—Participants who died or moved to unknown addresses were removed from the sample. Those not available for follow up for other reasons and those for whom validation was not possible were counted as smokers. Our final sample for analysis was 526 at six weeks and 505 at 12 months. Validated abstinence rates at six weeks and 12 months were similar in the two groups (table 2).

Adherence to the intervention procedures—Almost every patient in the intervention group was given a carbon monoxide reading and the study booklet. Less than 70% (178) signed a commitment card or were told about the opportunity to be paired with a "buddy." In only 7% (33) did nurses note that the "buddy" offer was accepted, and in only 4% (12) was the actual pairing with another patient recorded as having been organised. There was a significant difference in the mean number of elements implemented by each study site ($F_{16,257}$=4.2, P<0.0005). The only individual item that predicted continuous abstinence at 12 months was signing the commitment card; 43% of those who signed the card remained abstinent compared with 22% of those who did not (1.6, P=0.002).The intervention took an average of 34 minutes to implement (range 4-85 minutes), including obtaining informed consent and filling in the study questionnaire.

Table 2 Number (percentage) of participants not smoking (abstinence rate) at each follow up

Measure of abstinence	Control group	Intervention group	Mean difference in rates (95% CI)	P value
Six weeks*				
Continuous abstinence	152 (59)	159 (60)	0.9 (–7.5 to 9.3)	0.84
Point prevalent abstinence	154 (60)	160 (60)	0.5 (–7.9 to 8.8)	0.91
Twelve months†				
Continuous abstinence	102 (41)	94 (37)	–3.6 (–12.1 to 4.9)	0.40
Point prevalent abstinence	108 (43)	99 (39)	–4.1 (–12.6 to 4.5)	0.35

*Control n=259, intervention n=267.
†Control n=251, intervention n=254.

Discussion

This study showed that a single session intervention to prevent return to smoking in cardiac inpatients after discharge from hospital was not effective. Several issues may be relevant in the interpretation of our findings. The usual care may have provided a standard that was too high. Also, there may have been some contamination between the groups. However, in view of the fact that we recruited only those patients who were keen to remain abstinent, the abstinence rates suggest that neither intervention had much impact rather than that substantial impact was made by both.

The intervention was not always fully implemented; elements that were designed to encourage ongoing support were often left out. Implementation was related to outcome; in particular, signing the commitment card was strongly associated with successful abstinence. This is only an observational finding, and, although the commitment card was included in the belief that formalising the attempt to quit in this manner would be beneficial, the possibility remains that the intervention was offered preferentially to keen patients or that only those who were confident that they would be able to give up signed the form. More intensive training and rehearsal of the behavioural procedures may improve their delivery. However, time demands represented a serious barrier, and the existing requirements of the training and the intervention proved to be on the borderline of feasibility. The more complex behavioural approaches may not be suitable for routine implementation by non-specialist staff.

The intervention was given at a time when patients may have been too distraught or anxious to absorb the details of the intervention. However, at follow up patients remembered and appreciated the advice. Also, there are no other suitable times for input on prevention of relapse before patients are discharged. Later on, cardiac rehabilitation classes offer intervention opportunities, but many patients start to smoke again by then, and not all patients attend the classes.

The most likely explanation of the negative finding is that a single session intervention is not enough to reach this highly dependent group of smokers. This has been observed with other such groups.[10–12] The literature suggests a dose-response with regard to the intensity of the intervention, with the most successful results in cardiac patients occurring with an intervention consisting of eight contacts taking altogether three and a half hours.[6]

It may not be feasible for more intensive interventions to become part of routine care by staff whose primary responsibilities lie elsewhere. We were impressed with the overall competence and spirit of cardiac rehabilitation nurses, but even these highly motivated workers were unable to recruit suitable patients and to deliver the more involved elements of the intervention

What is already known on this topic

Stopping smoking after a serious cardiac event is associated with a significant decrease in mortality

Up to 70% of smokers who survive cardiac surgery smoke again within a year

Intensive interventions delivered by dedicated staff can help cardiac patients not to start to smoke again

What this study adds

An intervention delivered by cardiac rehabilitation nurses within routine care during patients' hospital stay failed to increase the number who managed to stop smoking in the long term

For busy staff with competing priorities, the 30 minute intervention was also on the borderline of practicability

Patients admitted after a myocardial infarction were over twice as likely to give up than those admitted for a bypass operation

consistently because of pressure on time and competing priorities.

Overall, the results are challenging and of direct practical relevance. Advice by doctors and nurses reaches primarily light "non-dependent" smokers.[13] Patients who suffer serious health consequences of their smoking, are keen to stop, and yet carry on smoking are typically highly dependent, and single session interventions do not seem to have sufficient power to help them. In these groups, interventions comprising several sessions with specialists have been shown to be effective.[14] The new specialist smoking cessation services, which are funded by the government and are now established in all health authorities to provide intensive behavioural and pharmacological treatments should collaborate with staff on wards and include hospital patients as one of their priority target groups.

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Excess winter mortality: influenza or cold stress? Observational study

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Epidemics of influenza are associated with increases in mortality and morbidity.[1] Health professionals and the media, therefore, have often focused their attention on influenza as a cause of increased mortality and demands on health services in winter. Cold weather alone causes striking short term increases in mortality, mainly from thrombotic and respiratory disease.[2] Non-thermal seasonal factors such as diet may also affect mortality.[3] The increases in mortality are greater in London than in regions surveyed in continental Europe.[4] We used multiple regression to assess the proportion of excess winter mortality that was attributable to influenza in south east England.

Methods and results

A daily record was kept of deaths that occurred in south east England from 1970 to 1999 for all causes and for influenza. We obtained daily estimates of population by linear regression from mid-year values (17.2×10^6 in 1971 and 18.4×10^6 in 1998) and used them to calculate mortalities. We used the maximum and minimum temperature at Heathrow Airport each

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