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Five year follow up of patients at high cardiovascular risk who took part in randomised controlled trial of health promotion

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Health promotion programmes for patients with coronary heart disease are valuable,^{1 2} but there is little evidence on their lasting effect.³ A randomised controlled trial in which patients who received personalised health promotion for two years showed significant benefits in lifestyle and quality of life.^{2 4} We investigated whether the differences in lifestyle, quality of life, and risk factors persisted between the two groups five years after enrolment.

Participants, methods, and results

Patients aged under 75 who had had angina (all grades included) for at least six months and no other concurrent serious illness were identified by 18 general practices in Belfast. Their diagnosis was confirmed at interview, and they were randomly allocated to receive either usual NHS care and personal health promotion from a trained nurse every four months for two years or usual NHS care alone. Sealed envelopes opened at interview showed group allocations. Both groups were reviewed after two years. Full details, including sample size calculations, have been reported previously.^{2 4}

Patients who completed the study were invited by letter to a five year follow up interview at their general practice surgery or their home. The nurse, blind to the trial group allocation, administered a questionnaire; measured height, weight, blood pressure, and breath carbon monoxide concentration; and took a blood sample for measurement of serum cholesterol concentration. Patients completed a Nottingham health profile questionnaire.

Distributions of age (mean 63 (SD 7)), sex (59% (408/688) male), and social class (I and II, 11% (72/688); III, 47% (325/688); IV and V, 42% (291/688) were similar in both groups. After five years 250 of the 342 (73%) in the intervention group (45 defaulted, 47 had died) and 237 of the 346 (68%) in the

non-intervention group (44 defaulted, 65 had died) were reviewed.

There were no significant differences between the groups in respect of blood pressure, serum cholesterol concentration, body mass index, reported frequency of angina, or restriction of activities at five years (table).

Differences between the groups both in mean reported exercise frequency and change of frequency were significant at two years ($P < 0.001$). The difference in change of frequency was significant at five years ($P < 0.05$). The non-intervention group reported a progressive decrease in exercise frequency over five years. The intervention group's mean exercise frequency had increased at two years but decreased subsequently.

At two years the intervention group's reported diet was better than and had improved significantly compared with that of the non-intervention group, but there were no significant differences between groups at five years. Differences between groups in mean quality of life scores at various times were not significant. The intervention group's score for social isolation showed improvement at two years but not at five years.

Initially there was no significant difference between groups in the proportion of patients who took drugs (glyceryl trinitrate, nifedipine) to prevent an angina episode; a greater proportion of the intervention group did so at both two and five years (131/250 (52%) *v* 94/237 (40%); $P < 0.001$) and five years (119/250 (48%) *v* 91/237 (38%); $P < 0.05$). Smoking cessation (self report validated by measurement of breath carbon monoxide concentration) was not significantly different between groups at five years (7/41 (17%) in the intervention group; 13/51 (25%) in the non-intervention group).

We also analysed the data on an intention to treat basis, with baseline or adjusted values being substituted for missing data, but this did not alter the conclusions.

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Mean values of variables at baseline and two year and five year follow up for those who completed study

Variable	No	At baseline		At 2 year follow up		At 5 year follow up	
		Mean	Mean difference between groups (95% CI)	Mean	Mean difference between groups (95% CI)	Mean	Mean difference between groups (95% CI)
Systolic pressure (mm Hg)							
Intervention	250	137.5	0.5 (-3.5 to 4.5)	137.1	2.0 (-1.8 to 5.7)	144.8	-0.8 (-5.2 to 3.5)
Non-intervention	237	137.0		135.2		145.6	
Diastolic pressure (mm Hg)							
Intervention	250	83.1	0.5 (-1.8 to 2.9)	77.4	0.4 (-1.5 to 2.4)	74.5	-1.3 (-3.6 to 1.0)
Non-intervention	237	82.6		77.0		75.8	
Serum cholesterol (mmol/l)							
Intervention	250	6.29	0.21 (0.01 to 0.40)*	6.15	0.09 (-0.10 to 0.28)	5.94	0.06 (-0.15 to 0.26)
Non-intervention	237	6.09		6.05		5.88	
Body mass index							
Intervention	250	27.4	0.2 (-0.6 to 1.0)	26.9	0.3 (-0.5 to 1.1)	27.0	0.2 (-0.6 to 1.0)
Non-intervention	237	27.2		26.6		26.8	
No of episodes of angina per week							
Intervention	250	3.3	0.9 (0.1 to 1.6)*	2.7	0.7 (0.1 to 1.4)*	2.6	0.1 (-0.7 to 1.0)
Non-intervention	237	2.4		2.0		2.5	
Physical exercise (score based on No of 20 minute episodes per week)							
Intervention	250	3.6	-0.2 (-0.5 to 0.1)	4.0	0.7 (0.4 to 1.0)***†††	3.0	0.2† (-0.2 to 0.5)
Non-intervention	237	3.8		3.2		2.8	
Diet (score based on frequency of eating certain foods‡; higher score=better diet)							
Intervention	250	21.1	0.0 (-0.8 to 0.8)	23.7	1.6 (0.9 to 2.4)***†††	22.6	0.4 (-0.3 to 1.2)
Non-intervention	237	21.1		22.1		22.2	
Nottingham health profile questionnaire (score)¶							
Emotion:							
Intervention	181	19.4	-0.4 (-5.5 to 4.7)	19.8	0.0 (-5.2 to 5.2)	19.0	-2.1 (-7.5 to 3.3)
Non-intervention	169	19.8		19.8		21.1	
Energy:							
Intervention	181	39.7	2.1 (-5.7 to 10.0)	41.9	0.5 (-7.8 to 8.8)	40.6	-4.7 (-13.2 to 3.7)
Non-intervention	169	37.5		41.4		45.4	
Mobility:							
Intervention	181	20.8	2.8 (-1.6 to 7.1)	21.9	-0.4 (-5.2 to 4.5)	24.3	-1.3 (-6.3 to 3.6)†
Non-intervention	169	18.0		22.3		25.7	
Pain:							
Intervention	181	17.5	1.8 (-2.8 to 6.4)	18.0	0.5 (-4.7 to 5.6)	19.0	-3.4 (-9.2 to 2.3)†
Non-intervention	169	15.7		17.5		22.4	
Sleep:							
Intervention	181	35.5	-1.1 (-8.0 to 5.9)	36.8	3.0 (-4.0 to 9.9)	34.4	-2.4 (-9.3 to 4.5)
Non-intervention	169	36.5		33.8		36.8	
Social isolation:							
Intervention	181	11.3	1.7 (-2.6 to 5.9)	10.3	-2.2 (-6.6 to 2.1)*	11.8	0.0 (-4.3 to 4.3)
Non-intervention	169	9.7		12.6		11.8	

*P<0.05, ***P<0.001: differences between groups in mean values at each time were compared by *t* tests; differences in frequencies were compared by χ^2 test. ††† P<0.001, † P<0.05 for differences in the extent of change in individuals within each group in comparisons between groups for each variable for baseline to 2 year follow up and baseline to 5 year follow up using *t* tests. Two tailed probability testing was used throughout. ‡Poultry, green vegetables, fruit, high fibre foods, red meat, biscuits, and fried food. ¶Baseline scores for 67 patients from each group were not valid and three patients did not complete the questionnaire at five years; these patients did not differ significantly from the remainder of the sample in any baseline measurement or characteristic.

Comment

Three years after the end of a personalised health promotion programme based in primary care for patients with angina most of the benefits identified at the end of two years had worn off. At the end of five years, benefits reported in respect of exercise and taking drugs prophylactically were still evident but smaller. The results suggest that prolonged provision of health promotion for patients may be desirable and support the recommendation that secondary prevention in coronary heart disease should be a healthcare priority.⁵

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