ORIGINAL PAPERS

Coronary heart disease: account of a preventive clinic in general practice

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SUMMARY. Men between the ages of 25 and 45 years attending a surgery were screened for risk of heart disease. An 'at-risk' group of 188 men were identified and 118 of them (63 per cent) accepted an invitation to attend a coronary heart disease prevention clinic at the practice. A sample of the attending group showed favourable changes in risk factors one year later.

Subsamples of 20 men from the attending and non-attending groups were interviewed at the clinic or at home; they showed significant differences with respect to employment status, family history of myocardial infarction and knowledge about coronary heart disease as a cause of death in the United Kingdom. Implications for preventive programmes of this nature are discussed, and the need to utilize routine doctor-patient contacts for health education and prevention is stressed.

Introduction

THERE is a strong case for involving the general practitioner and the whole primary health care team in the prevention of coronary heart disease;[1,2] studies have shown that it is possible to control risk factors for coronary heart disease within the setting of general practice.[3-5] The Royal College of Physicians report on prevention of coronary heart disease[6] suggested that the general practitioner should play a key role in identifying those people at high risk of developing coronary heart disease and should concentrate on this group in an attempt to reduce their risk factors.

The major risk factors for coronary heart disease are cigarette smoking, hypertension and raised serum cholesterol levels (especially low density lipoprotein cholesterol, LDL), the effect of these individual factors being additive.[7] Other recognized risk factors include physical inactivity, obesity, family history of coronary heart disease, diabetes mellitus, personality, stress and age. These factors are interrelated and some have behavioural components which can be modified.

Aims

The aims of the study were to assess the impact of a heart disease prevention clinic on a high risk group of patients and to compare characteristics of attenders at the clinic with non-attenders. It was decided to limit the study to men in the age group 25-45 years: coronary heart disease develops over a long period of time,[8] hence the possible advantage of choosing a young target group; heart disease is known to be more prevalent in males than females at a younger age; and men in this age group attend their general practitioner relatively infrequently, so it is important to make the best use of any contact to initiate preventive action.

Method

Craigshill Health Centre in Livingston New Town, West Lothian, serves a population of approximately 8,000 patients. Over a three-year period, six doctors at the health centre screened men aged 25-45 years during routine surgery attendances, to determine their smoking and exercise habits, weight, blood pressure and family history of coronary heart disease

using a simple scoring proforma (Figure 1). By this case-finding approach a group of men considered to be at risk of developing coronary heart disease was identified. Each of these men was invited by letter to attend a monthly clinic, run by one of the doctors, for a physical examination and estimation of blood lipids; this consultation included information and advice about alteration of habits and lifestyle, for example, reducing smoking, increasing exercise and reducing intake of saturated fat in the diet. In an effort to influence exercise habits a keep-fit group was started, as part of an adult education class, attended by the doctor involved in the project. Activities included circuit-training, indoor football, badminton, volleyball and swimming, the emphasis being on a gradual build-up of physical fitness. An antismoking group was also organized by the clinical psychologist at the health centre. A health visitor subsequently visited at home the men who attended the clinic, to reinforce advice already given and to involve other members of the family where appropriate. The clinic attenders were offered a review appointment one year later at which any changes in lifestyle and risk factors would be recorded.

Over a period of six months, a sample of 20 consecutive clinic attenders and 20 'at-risk' non-attenders were interviewed using an extensive questionnaire. The attenders were interviewed when they came to the clinic at the health centre and the non-attenders were interviewed at home. The information was used to compare the two groups of men in relation to marital status, employment status, social class, risk factors for coronary heart disease, family history of myocardial infarction, knowledge and perception of health problems. Over the same six-month period, all the men who attended for their annual review appointment were assessed in detail for changes in risk factors, occurring over a one-year period, in respect of smoking habits, exercise, weight, blood pressure and blood lipid profile.

NAME DATE OF BIRTH
ADDRESS REF. NO.
DATE OF EXAM.

SMOKING HABITS — Enter code in box

0	1	2	3
Nonsmoker	1–4 cigarettes per day Pipe or cigar smoker	5–14 cigarettes per day	Above 14 cigarettes per day

Actual number of cigarettes per day.....

BODY BUILD

Height in normal shoes..... Estimated/measured
Weight in indoor clothes..... Estimated/measured

0	1	2	3
Lean	Medium build	Overweight	Very obese

BLOOD PRESSURE Actual measurement.....

0	1	2	3
<130/85	<140/95	<150/100	>150/100

EXERCISE

0	1	2	3
Regular vigorous exercise and/or heavy physical work	Regular recreational exercise	Occasional exercise	Sedentary occupation and no exercise

FAMILY HISTORY Please specify if relevant

0	1	2	3
No significant family history	Some family history of coronary artery disease	First degree relative over 50 years old	First degree relative under 50 years old

OVERALL ASSESSMENT Tick as appropriate

Low risk
Borderline and would benefit from advice
High risk and referred to clinic
TOTAL

Figure 1. *Scoring proforma.*

Results

Over a period of three years, 188 men were identified as 'at risk' from a screened population of 690 men. Of the men considered to be at risk, 118 (63 per cent) accepted the invitation to attend the clinic. The 70 men (37 per cent of the 'at-risk' group) who failed to attend the clinic gave no reason for their non-attendance.

Attenders

Of the 118 men who attended the clinic 86 (73 per cent) subsequently attended for annual review. During the six-month period of the study, 37 men attended for their annual review; the detailed changes in lifestyle and risk factors of this subsample are summarized in Table 1. The paired difference t-test was used to compare changes in weight, blood pressure and plasma lipids over one year.

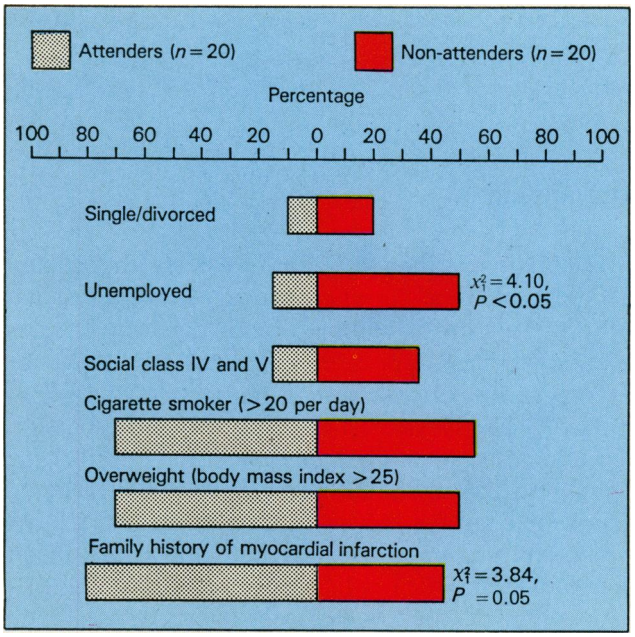

Figure 2. *Differences between attenders and non-attenders.*

Three of the men who claimed to have reduced their cigarette smoking and one who claimed to have stopped completely were attending the antismoking group at the health centre. Nineteen of the 24 men who claimed to be taking more exercise were attending the keep-fit group on a regular basis. In addition to dietary advice given at the clinic, five men considered overweight (body mass index greater than 25) had attended the dietitian at the health centre. Of the four men who had initially had a diastolic blood pressure above 95 mmHg recorded, one man was known to have hypertension and was on treatment, one man was subsequently started on drug treatment and two men responded satisfactorily to weight reduction.

Seventeen men (46 per cent) of the 37 attending for annual review had abnormal fasting lipid profiles at the initial visit: four men had cholesterol levels above 6.5 mM (raised beta bands), 10 had triglyceride levels above 2.1 mM (raised pre-beta bands) and three men had elevation of both cholesterol and triglyceride levels (raised beta and pre-beta bands). All 17 men were treated by diet alone, 11 of them attended the dietitian at the health centre.

Differences between subsamples of attenders and non-attenders

The main differences between the two sample groups are shown in Figure 2. The attenders also gave a more accurate ranking for coronary heart disease as a cause of death in the UK. The difference was statistically significant ($P < 0.05$) using the Wilcoxon rank sum test.

With regard to perception of the individual's own risk for coronary heart disease, 80 per cent of the respondents in each group considered they had only 'average risk': all these were men considered to have a higher than average risk of developing coronary heart disease by our criteria.

Discussion

The favourable changes in risk factors for a sample of the attending group, over a one-year period, are similar to those achieved in other studies from general practice.[3-5] In our own study, a high percentage of the clinic attenders were cigarette smokers and this probably relates to the initial screening criteria which emphasized smoking habits. Relatively few men attended the antismoking group, and it seems likely that advice about smoking from an individual general practitioner is equally effective and probably more relevant in this context.[9] The keep-fit group was a success, with approximately 50 per cent of the clinic attenders participating on a regular basis. It proved an enjoyable leisure activity and developed a sense of involvement and group spirit among the participants. Since the numbers attending were manageable, training programmes could be tailored to individual needs and fitness levels, and fortunately no serious accident or medical problems arose during the activities.

Forty-six per cent of the men attending for annual review had abnormal fasting lipid profiles at the initial visit. This seems a high figure, and it may be that our particular method for defining 'at-risk' status gives a high yield for hyperlipidaemia. However, the total numbers in this study are small and the results would have to be substantiated in a larger study. The significant reduction in triglyceride levels achieved after one year ($P < 0.05$) may have been related to a combination of increased physical exercise, dietary changes and weight reduction. Total cholesterol levels were not significantly altered.

Attenders compared with non-attenders

A significant problem in this and other coronary prevention studies from general practice[3-5] is the 'non-response' or 'non-attendance' rate, which in the three studies quoted was respectively 43 per cent, 36 per cent and 25 per cent. In our study, 37 per cent of the total 'at-risk' group identified failed to attend the clinic.

Interpretation of the reasons behind attendance and non-attendance is difficult. Non-attendance does not necessarily mean non-interest or non-compliance but may well be a reflection of priorities for the individual concerned, such as timing of the clinic, difficulty getting off work or financial considerations.

When compared with the attenders, significantly more of the non-attenders were unemployed at the time of invitation (Figure 2) and more of them were in social class IV and V (Registrar General's classification). The implications of this could be important in that several of the non-attenders indicated possible financial and domestic problems in relation to changing their diet. A combined health examination and population study in Sweden[10] showed that significantly more of the non-participants were in the lower income range and considered to be in need of socioeconomic support. It may well be that unemployment and financial status are factors which influence the response to health prevention programmes, but again this would have to be explored in greater depth in a larger study.

Another significant difference between the two groups related to family history of myocardial infarction. Eighty per cent of the attending group (Figure 2) said that at least one member of the family had suffered a heart attack in the past compared with 45 per cent of the non-attending group. A population-based cardiovascular disease study in America[11] found that responders had a much stronger family history of

myocardial infarction than non-responders. Family history may be an important factor in influencing response to cardiovascular intervention programmes, possibly through a psychological effect of sensitizing the individual to the problem of coronary heart disease.

The 'health belief model'[12] states that in order for an individual to take any preventive health action it is necessary for him to perceive that the disease is serious, that he himself is susceptible, and that the benefits of the health action outweigh any disadvantages involved in taking such action. Men in the attending group gave some indication that they appreciated the serious consequences of coronary heart disease, but the fact that the majority did not perceive themselves to be of more than average risk might be a negative factor with regard to appropriate health action. A development of this theory is the 'health action model',[13] which indicates that without strong positive motivation action about health matters is unlikely even if strong beliefs are held. In the attending group, it is possible that heavy cigarette smoking, being overweight and having a positive family history for myocardial infarction may act as motivational forces.

The fact that 70 men in the age range 25-45 years—that is, 37 per cent of the total 'at-risk' group identified—did not attend the coronary heart disease prevention clinic at the general practice indicates an important 'missed opportunity' for preventive action, in that these men had already attended the health centre on at least one previous occasion. The advantage of a separate clinic is that more time is available than during routine surgery consultations, and it is encouraging that the majority of men in the 'at-risk' group did attend the clinic. However, it would appear that, in addition to special clinic sessions, there is a need to utilize routine doctor-patient contacts for preventive action in this age group, particularly where case-finding or simple screening indicates the individual to be 'at risk'. The potential for preventive care at each primary care consultation is well recognized.[9,14,15]

It is important to involve the health visitor in reinforcing specific advice given during a routine consultation or at the special clinic, possibly by a home visit to involve other members of the family or household where appropriate. Certain categories of patients with whom compliance might be a problem, such as the unemployed, could benefit from such intervention.

Table 1. Changes in risk factors for coronary heart disease in the subsample of men attending for annual review ($n = 37$).

Risk factor	No. of men	(%)	Mean change in risk factor after one year	SD	Significance
Smoking					
Claimed to have:					
stopped smoking completely	3	*(8)*			
smoked fewer cigarettes per day	14	*(38)*			
no change in smoking habits	16	*(43)*			
remained as a non-smoker	4	*(11)*			
Exercise					
Claimed to be taking:					
more exercise	24	*(65)*			
same amount of exercise	11	*(30)*			
less exercise	2	*(5)*			
Weight					
Initial weight:					
< 70 kg	8		+0.32 kg	2.8 kg	NS
70-80 kg	10		−0.24 kg	2.1 kg	NS
> 80 kg	19		−0.95 kg	3.0 kg	NS
Blood pressure					
Initial diastolic blood pressure:					
> 95 mmHg	4		−6.4 mmHg	8.2 mmHg	$P < 0.10$
85-95 mmHg	9		−2.2 mmHg	6.5 mmHg	NS
< 85 mmHg	24		−1.2 mmHg	4.6 mmHg	NS
Lipids					
Initial cholesterol levels > 6.5 mM	7		−0.12 mM	0.5 mM	NS
Initial plasma trigyceride levels > 2.1 mM	13		−0.20 mM	0.3 mM	$P < 0.05$

SD = standard deviation; NS = not significant.

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