

Doctors' opinions on the prevention of myocardial infarction

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SUMMARY. In 1979, 1981 and 1983 random samples of approximately 200 general practitioners, 200 members of the Royal College of General Practitioners and 200 hospital physicians were asked to list, in order of effectiveness, measures which they considered useful in the prevention of myocardial infarction and reinfarction. The overall response rate was 67% and of the responses 77% were eligible for inclusion in the analysis.

There was a high degree of concordance between the opinions of the nine doctor-year groups (Kendall's $W = 0.89$, $P < 0.001$). Behavioural measures, such as diet, weight control, exercise and cessation of smoking, were mentioned frequently and were ranked above most drug therapies. Overall, opinions concerning the relative utility of different measures did not change between 1979 and 1983 yet there were significant changes in the frequency with which specific therapies were mentioned as useful preventive measures. Beta-blockers, calcium channel blockers, and arteriograms/coronary artery bypass grafting were mentioned more frequently in 1983 than in 1979 while lowering the lipid levels (with drugs) and sulphapyrazone were mentioned less frequently. The changes in the opinions of doctors are discussed in the context of new therapeutic information published between 1979 and 1983.

Introduction

PREVENTION of coronary heart disease provides the most promise for reducing the morbidity and mortality of myocardial infarction. Little is known about the opinions of practising doctors on the utility of measures recommended for primary and secondary prevention of myocardial infarction. This study was designed to obtain these opinions, to rank them in order, and to monitor changes in attitude as new information became available.

Method

In 1979 a short open-ended questionnaire was sent to random samples of approximately 200 hospital physicians, 200 members of the Royal College of General Practitioners and 200 general practitioners who were not members of the College. The same questionnaire was sent to further random samples of the three groups in 1981 and 1983. The doctors were asked to: 'List the drugs and other measures which you consider using in long term prevention of myocardial infarction or reinfarction from the more useful to the less useful'. The questionnaire was sent once to each

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group. If respondents were not actively practising medicine or treating patients with myocardial infarction their responses were not included. These doctors may not be influenced in the same way by new information as those in practice and their opinions will not directly affect the care of those with myocardial infarction.

The responses were coded into 27 categories. Some of the categories may not be mutually exclusive. For example, the category 'lower lipid levels' included responses such as 'lower or treat lipid levels', 'treat hyperlipidaemia', 'treat high cholesterol levels', 'Atromid-S (ICI)', 'clofibrate', or 'lipid-lowering agents'. The category 'diet' included any mention of diet with any changes intended by the doctor — responses such as 'low-fat diet', 'diet to lose weight' and 'low-sodium diet' were included in this category.

Statistical methods

Each doctor was considered to have voted for the various measures he listed for preventing myocardial infarction and to have ranked them according to his opinion of their relative usefulness. A system of voting analysis for multi-candidate elections was therefore used to analyse the responses.¹ This takes into account all the votes cast and ranks the measures chosen on the basis of a series of comparisons of pairs. If measure A is preferred more often than measure B, measure A wins and B loses that particular pair contest. The measure which is preferred above all others (that is, the measure with the best win/loss record) gets the rank of one, the measure which is preferred the next most frequently gets the rank of two, and so on. One consequence of this system is that although a given measure A may be mentioned more frequently than measure B, A may be ranked lower than B if when the two measures are listed together, B is preferred to A.

The agreement between the ranked lists of measures was tested using Kendall's coefficient of concordance, W .² If $W = 1$ this implies perfect agreement between the lists; if $W = 0$ this implies no relationship between the order of the lists. A chi-square statistic was used to test the significance of W . Changes in frequencies by year for individual measures were tested using a two sample t-test. A statistic was considered significant at the 5% level (two tailed).

Results

A lower proportion of non-MRCGP general practitioners responded than did MRCGPs and hospital physicians. Overall, the response rate was lower in 1983 (62%) than in 1979 (69%) or 1981 (71%). Of the responses, 79%, 75% and 80% were eligible for inclusion in the analysis in 1979, 1981 and 1983, respectively. The mean number of measures mentioned per respondent was between four and five measures for each group of doctors in each year of the study.

The concordance (W) between the nine ranked lists of preventive measures was 0.89 ($\chi^2_{26} = 207.2$, $P < 0.001$). Since the concordance was high, the responses of all three groups were pooled for each year of the study. Table 1 shows the rank ordered lists of measures for each year and the frequency with which each measure was mentioned (items mentioned by less than 1% of the doctors have been omitted). Changes in the percentage

Table 1. Rank order of measures considered useful by doctors in the prevention of myocardial infarction (numbers in parentheses indicate the percentage of doctors mentioning the particular measure).

Rank	Recommended measures					
	1979 (<i>n</i> = 336)		1981 (<i>n</i> = 339)		1983 (<i>n</i> = 317)	
1	Cessation of smoking	(59)	Cessation of smoking	(64)	Cessation of smoking	(67)
2	Beta-blockers	(69)	Weight control	(56)	Beta-blockers	(83)
3	Weight control	(56)	Beta-blockers	(63)	Weight control	(52)
4	Treat high blood pressure	(44)	Exercise	(48)	Exercise	(48)
5	Exercise	(43)	Treat high blood pressure	(43)	Treat high blood pressure	(37)
6	Diet	(33)	Diet	(26)	Diet	(33)
7	Lower lipid levels	(40)	Lower lipid levels	(21)	Aspirin	(22)
8	Aspirin	(23)	Aspirin	(20)	Lower lipid levels	(16)
9	Avoid stress	(15)	Avoid stress	(18)	Avoid stress	(15)
10	Sulphinpyrazone	(13)	Sulphinpyrazone	(14)	Anticoagulant drugs	(11)
11	Anticoagulant drugs	(10)	Treat arrhythmias	(9)	Calcium blockers	(10)
12	Nitrates	(10)	Nitrates	(10)	Dipyridamole	(10)
13	Other drugs	(10)	Calcium blockers	(9)	Nitrates	(9)
14	Treat arrhythmias	(8)	Anticoagulant drugs	(9)	Treat arrhythmias	(6)
15	Control diabetes	(7)	Control diabetes	(7)	Arteriograms/CABG	(6)
16	Dipyridamole	(6)	Dipyridamole	(5)	Sulphinpyrazone	(5)
17	Digoxin	(4)	Other drugs	(4)	Control diabetes	(4)
18	Vasodilators	(3)	Arteriograms/CABG	(3)	Platelet agents	(3)
19	Arteriograms/CABG	(3)	Platelet agents	(2)	Other drugs	(3)
20	Calcium blockers	(2)	Vasodilators	(2)	Vasodilators	(2)
21	Other behavioural	(2)	Avoid high altitude	(2)	Digoxin	(2)
22			Digoxin	(2)	Avoid high altitude	(2)
23					Other behavioural	(2)
24					Avoid excess alcohol	(2)

CABG = coronary artery bypass grafting.

of doctors mentioning a measure reflect changes in their awareness of individual measures, while the ranking shows the relative importance of the measures. The concordance (*W*) between the three lists is 0.96 ($\chi^2_{26} = 75.1$ $P < 0.001$). Overall there has been little change in the opinion of doctors on useful measures for preventing myocardial infarction between 1979 and 1983. Behavioural and life-style changes were mentioned often and were ranked above most drug therapies. Beta-blockers were mentioned more frequently than any other item, but when considered with cessation of smoking, most doctors believe cessation of smoking to be more useful.

Between 1979 and 1983 the following significant changes occurred in the frequency with which specific measures were mentioned. Beta-blockers were mentioned more frequently (69% to 83%). Lowering lipid levels (with drugs) was mentioned less frequently (40% to 16%) as was sulphinpyrazone (13% to 5%). Arteriograms and coronary artery bypass grafting were mentioned more frequently (3% to 6%) as were calcium blockers (2% to 10%).

Discussion

Other investigators have studied the attitudes of doctors to the management of patients with acute myocardial infarction.^{3,4} This is the first study in the UK of doctors' opinions regarding the prevention of myocardial infarction (both primary and secondary) and monitors changes in their opinions between 1979 and 1983. An open-ended questionnaire, while more difficult to code and more susceptible to respondent interpretation, provides a

less biased assessment of opinion than a closed questionnaire — respondents are not prompted by the presence of specified options.⁵ The responses are unlikely to be badly biased since three different groups of doctors gave similar responses. Comparisons between the years are valid because the overall response rates were similar for the three years studied. Voting analysis methods allow full use of the responses to determine the relative utility of the measures mentioned.¹

Behavioural measures were clearly preferred to drug interventions for the prevention of myocardial infarction. Of the top six ranks, four were measures which require behavioural modification. These results agree with previous recommendations^{6,7} and also with the results of a survey of Tayside general practitioners regarding the advice which they would give to patients after myocardial infarction.⁴ It is perhaps disappointing that larger proportions of doctors are not convinced of the utility of behavioural changes in the primary and secondary prevention of myocardial infarction. However, with the exceptions of cessation of smoking^{8,9} and a life-long habit of exercise,¹⁰ there is little evidence from prospective studies that changes in diet, weight, activity level or blood pressure, begun in middle age, reduce the risk of myocardial infarction or reinfarction.

It is difficult to test whether the literature on the prevention of myocardial infarction with drugs has influenced the opinions of doctors. However, changes in the frequency with which certain measures are mentioned merit comment.

Lower lipid levels were mentioned by 40% of doctors in 1979

and by 16% in 1983. This decrease occurred after details of the World Health Organization cooperative trial had been published in 1978.¹¹ The results showed that persons taking clofibrate had a 25% decrease in non-fatal myocardial infarction, but a 27% increase in total mortality during the trial. The recently published study by the Lipid Research Clinic where cholestyramine was used to lower cholesterol levels may also alter the thinking of doctors.¹² This study showed a 24% reduction in fatal myocardial infarction and no significant change in total mortality.

Sulphinpyrazone was considered to be useful in the prevention of myocardial infarction by 13% of doctors in 1979, and by 5% in 1983. Reports from the Anturane Reinfarction Trial Research Group, published in early 1978 and 1980,^{13,14} suggested a 32% reduction in cardiac mortality but this trial was criticized by the Food and Drugs Administration.¹⁵ A second study from Italy¹⁶ published in 1982 showed a 54% reduction in reinfarction in those taking sulphinpyrazone — this result did not appear to alter the opinions held by doctors in 1983.

Aspirin was mentioned as useful in the prevention of myocardial infarction by 23% of doctors in 1979 and by 22% in 1983. Prior to 1979 there had been two trials which showed 25–30% reductions in total mortality among those taking aspirin following myocardial infarction.^{17,18} Two more trials published in 1979 reported 18% and 17% reductions in total mortality.^{19,20} In 1980, the Aspirin Myocardial Infarction Study²¹ showed no benefit from aspirin, while the Persantine-Aspirin Reinfarction Study demonstrated an 18% reduction in mortality.²² Taken individually, none of these trials is conclusive, but when the results are pooled²³ aspirin is clearly efficacious in preventing reinfarction. The reports appear to have had no effect on the opinions of doctors either because individually they report a small effect, or because the largest trial showed no benefit.²¹

There was no overall change in the frequency with which anticoagulant drugs were mentioned — 10% in 1979 and 11% in 1983. Although anticoagulant drugs are beneficial in the secondary prevention of myocardial infarction (this point was underlined by a randomized trial in 1980²⁴), enthusiasm for these agents is tempered by bleeding complications and the need to monitor the therapy closely.

Beta-blockers were considered useful in preventing myocardial infarction by 69% of doctors in 1979 and by 63% in 1981. In 1983, this percentage had increased to 83%. Prior to 1979 at least four reports showed a 25% reduction in the risk of death following myocardial infarction on long-term administration of beta-blockers.²⁵ In 1981, three large randomized placebo controlled trials involving 7116 patients and three different beta-blockers all showed significant reductions in reinfarction with active drug therapy.^{26–28} Consequently more doctors considered beta-blockers to be useful.

Calcium blockers were mentioned as a useful preventive measure by 2% of doctors in 1979 and by 10% in 1983. This five-fold increase is intriguing as these agents are effective in treating angina pectoris and lowering blood pressure²⁹ but as yet there is no evidence from prospective studies that they prevent myocardial infarction or reinfarction. Randomized controlled trials are needed to test their efficacy.

The percentage of doctors who mentioned arteriograms and coronary artery bypass grafting rose from 3% in 1979 to 6% in 1983. In 1982 the European Coronary Surgery Study Group reported improved survival for patients undergoing coronary artery bypass grafting who had abnormal resting electrocardiograms, ST segment depression with exercise and peripheral vascular disease.³⁰ In the absence of these three factors, there was no difference in survival between groups receiving medical or surgical treatment. In 1983 the Coronary Artery Surgery Study showed no difference in survival between medically and surgically

treated groups.³¹ Patients undergoing coronary artery bypass grafting had better control of their angina, but there were no differences between regimens in terms of employment status or recreational activity.³² The role of coronary artery bypass grafting as a proven preventive measure may be limited to those persons with left main coronary disease or angina unrelieved by medication and to other selected subgroups.³³

Busy practitioners often do not have the time to keep up with medical literature. Despite the publication of relevant evidence between 1979 and 1983 doctors have not greatly altered their opinions about what may be useful for the primary and secondary prevention of myocardial infarction. Information concerning the utility of specific measures, proven (beta-blockers) or unproven (calcium blockers or coronary artery bypass grafting), is reaching doctors. Debates about other measures (lipid lowering agents or sulphinpyrazone) have also affected opinion. Measures which have shown favourable but undramatic results, such as aspirin, have not altered the opinions of doctors. Effective methods must be designed to convince more doctors of the worth of some measures and to discourage their use of other measures. The results reported here provide a baseline for judging the impact of educational programmes designed to improve the clinical practice of preventive cardiac medicine on the opinions of doctors.

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