

Physicians' attitudes to the treatment of elevated serum cholesterol

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ABSTRACT – A questionnaire was sent to 457 physicians (328 general practitioners, 129 hospital doctors) to assess their attitudes to and their knowledge and practice of the management of raised serum cholesterol. Replies were returned by 206 (63%) general practitioners and 95 (74%) hospital doctors. While smoking, hypertension, diabetes mellitus and elevated total serum cholesterol were recognised as major risk factors for coronary heart disease, a significant number of respondents considered serum triglycerides to be less important. Both groups of physicians start dietary management at similar total serum cholesterol levels, but hospital doctors were more likely to use dietetic services. The two groups had a similar threshold for the addition of drug therapy. A bile acid sequestrant was the favoured first choice as a cholesterol lowering agent, although a wide variety of other drugs were also chosen. The screening of high risk patients was preferred to whole population and opportunistic screening for identifying hypercholesterolaemic individuals. The findings have important implications in the delivery of services to hypercholesterolaemic patients.

Coronary heart disease (CHD) is a major cause of morbidity and mortality in the western industrialised world, and the United Kingdom rate is amongst the highest [1]. A raised level of serum cholesterol, in particular LDL cholesterol, significantly contributes to an individual's risk of suffering from CHD [2, 3]. Lowering elevated serum cholesterol reduces the risk of CHD [4, 5] and may produce regression of atherosclerotic lesions [6, 7]. Policy statements have come from North America [8], Europe [9] and the United Kingdom [10] with recommendations for assessing risk factors for CHD and screening, and for the level of total serum cholesterol at which intervention should be initiated. These policy statements raise complex practical

issues since, for example, in Scotland 35% of the population are above the threshold for treatment [11].

The successful implementation of any health policy depends greatly on the motivation and attitudes of physicians who see the patients. We have therefore conducted a postal questionnaire survey to investigate the attitudes of both general practitioners and hospital doctors to the screening and treatment of hypercholesterolaemia in Tayside.

Subject and methods

The questionnaire for this survey was sent to all general practitioners (including trainees) and all post-registration hospital doctors of all grades in general medicine and its subspecialties on the Tayside Health Board's list.

The questionnaire, with a covering letter explaining the purpose of the study and a stamped addressed envelope, was mailed to 457 physicians (328 general practitioners, 129 hospital doctors) in a single batch in April 1989. The multiple choice questionnaire consisted of ten stem items and was designed to be completed within 10 minutes by the respondent who remains anonymous. The results were analysed using the chi-squared test to assess differences between groups. A *p* value of <0.05 was considered significant. When apply-

Table 1. Numbers of questionnaire respondents in each grade and mean intervals (years \pm SD) since qualification

	Number of responders	Years since qualification
General practitioner principal	179	20.2 \pm 9.6
General practitioner trainee	27	4.5 \pm 3.0
Consultant	38	23.1 \pm 9.9
Senior registrar	12	10.5 \pm 3.1
Registrar	23	5.4 \pm 1.7
Senior house officer	22	4.2 \pm 3.3

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Table 2. Ratings (percentages) of the importance of coronary heart disease risk factors as assessed by general practitioners and (in parentheses) hospital doctors

	Very important	Important	Of little importance	Of no importance
Smoking	95 (93)	5 (5)	0 (2)	0 (0)
Hypertension	60 (57)	38 (38)	2 (3)	0 (2)
Diabetes mellitus	59 (58)	39 (39)	2 (1)	0 (2)
Obesity	27 (17)	61 (61)	12 (19)	0 (3)
High fat diet	19 (18)	66 (57)	15 (20)	1 (5)
Sedentary lifestyle	13 (3)	60 (55)	28 (38)	0 (3)
Stress	11 (7)	51 (47)	35 (38)	3 (7)
Elevated total serum cholesterol	35 (57)	58 (38)	6 (2)	0 (3)
Elevated total serum triglycerides	12 (12)	59 (39)	28 (39)	2 (11)
LDL cholesterol	35 (46)	43 (37)	18 (11)	5 (6)
HDL cholesterol	29 (36)	44 (41)	21 (14)	7 (10)

ing chi-squared testing between non-independent groups, we weighted the observations in inverse proportion to the number of responses being compared.

Results

Questionnaires were returned by 206 (63%) general practitioners and 95 (74%) hospital doctors from general medicine and its subspecialties. The grades and intervals since qualification of the responders are given in Table 1.

The response to the question 'How important do you consider the following risk factors to be on the incidence of CHD' is given in Table 2, comparing general practitioners and hospital doctors. General practitioners gave a sedentary lifestyle greater importance than did hospital doctors ($p < 0.05$). Hospital doctors of all grades attributed more importance to elevated serum cholesterol ($p < 0.0001$) but less to elevated serum triglyceride ($p < 0.001$) than general practitioners. Junior doctors considered elevated total serum

cholesterol a greater risk than did their seniors (consultants and general practitioner principals) ($p < 0.05$) but this difference was not seen in the general practitioner comparison.

Figure 1 demonstrates the levels of total serum cholesterol at which respondents usually initiate dietary therapy in a middle aged man with no history of CHD; there was no difference between hospital doctors and general practitioners. However, about 10% of the former either did not know or would not treat, compared with only 1% of general practitioners. To initiate therapy, 27% of hospital doctors said they would refer the patient to a dietitian, the most popular action being verbal advice and a leaflet (17%). General practitioners chose verbal advice and a leaflet as the most common method (38%), with verbal advice or a leaflet alone adding 10% and 8% to this number; they were much less likely (5%) to refer the patient to a dietitian.

The effect of various other factors on hospital doctors' threshold for dietary therapy is shown in Table 3.

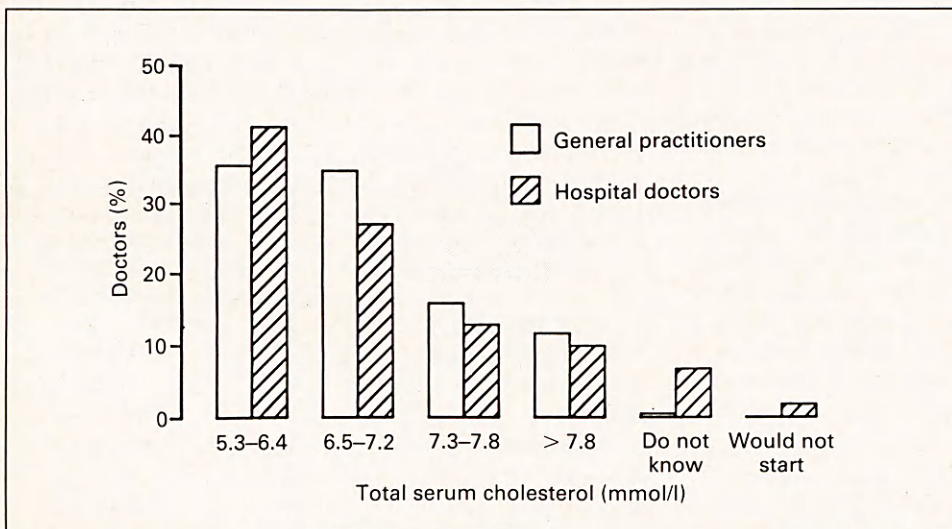


Fig. 1. Level of total serum cholesterol (mmol/litre) at which dietary therapy is initiated.

Table 3. Factors influencing the initiation of dietary therapy by consultants and (in parentheses) junior hospital doctors; the figures are percentages

	No influence	Raise threshold	Lower threshold
Personal history of CHD	5 (2)	76 (93)	18 (5)
Family history of CHD	3 (0)	82 (98)	16 (2) ^a
Smoker	0 (4)	68 (84)	32 (12) ^b
Excess alcohol intake	8 (16)	32 (40)	61 (44)
Age (younger patient)	5 (2)	76 (91)	18 (7)
Impaired glucose tolerance	5 (7)	58 (79)	37 (14) ^c

^a $\chi^2 = 8.3, p < 0.05$. ^b $\chi^2 = 6.3, p < 0.05$. ^c $\chi^2 = 6.6, p < 0.05$.

These factors were less likely to influence the threshold of consultants than that of junior hospital doctors, the difference in practice being significant ($p < 0.05$) in the case of a family history of CHD, a smoker and the presence of impaired glucose tolerance. Other doctor group comparisons showed no significant differences.

Table 4 gives responses to questions related to diet. Forty per cent of consultants agreed with the 15% of calorie intake as polyunsaturated fats compared with 18% of their juniors ($p < 0.05$); a similar answering pattern was given by all senior doctors compared with all juniors ($p < 0.01$). Dietary management for three months prior to drug therapy was not considered appropriate by 45% of all junior doctors compared with 31% of senior doctors ($p < 0.05$). Other comparisons showed no significant differences.

The levels of total serum cholesterol at which respondents said they would initiate drug therapy following inadequate dietary response are shown in Fig. 2; there is no significant difference between the groups. Figure 3 gives the first choice of drug to lower serum cholesterol and again shows no difference between the groups. A bile acid sequestrant was

Table 4. Agreement or otherwise with statements relating to dietary principles by general practitioners and (in parentheses) hospital doctors; the figures are percentages

	Agree	Neither agree nor disagree	Disagree
The typical British diet contains excessive fat	93 (91)	7 (10)	0 (0)
Reduction in dietary cholesterol will reduce serum cholesterol	60 (57)	32 (35)	8 (8)
Olive oil is appropriate for cooking in a cholesterol reducing diet	58 (70)	27 (23)	15 (7)
15% of calorie intake as polyunsaturated fat is recommended	25 (26)	66 (50)	10 (24) ^a
Drug therapy should be initiated following inadequate response to dietary management for 3 months	25 (34)	40 (31)	35 (36)

^a $\chi^2 = 12.4, p < 0.01$.

favoured by 45% of respondents, and 23% selected one of the fibrate class. Hospital doctors were more likely to use gemfibrozil and general practitioners to use bezafibrate ($p < 0.01$). Opinions as to the responsibility for taking the initiative on drug usage in hyperlipidaemia are shown in Table 5; the difference between senior and junior doctors on this point is significant ($p < 0.05$). While there was little difference in the role given to the lipid clinic by either group, senior doctors gave greater responsibility to the general practitioners than did the juniors, and in this respect trainee general practitioners felt like the other junior doctors. Senior doctors also differed significantly ($p < 0.05$) from their juniors in their choice of the cholesterol screening option, with 83% of junior doc-

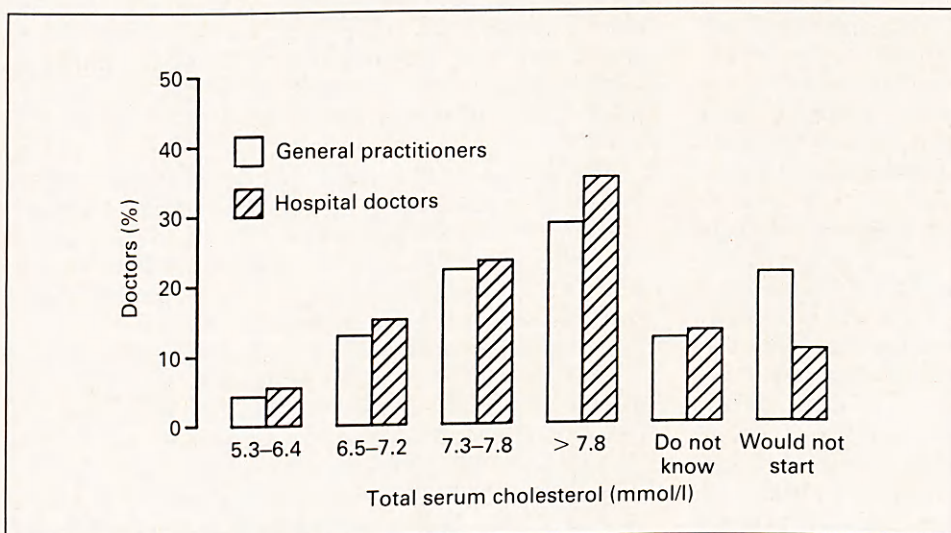


Fig. 2. Level of total serum cholesterol (mmol/litre) at which drug therapy is added.

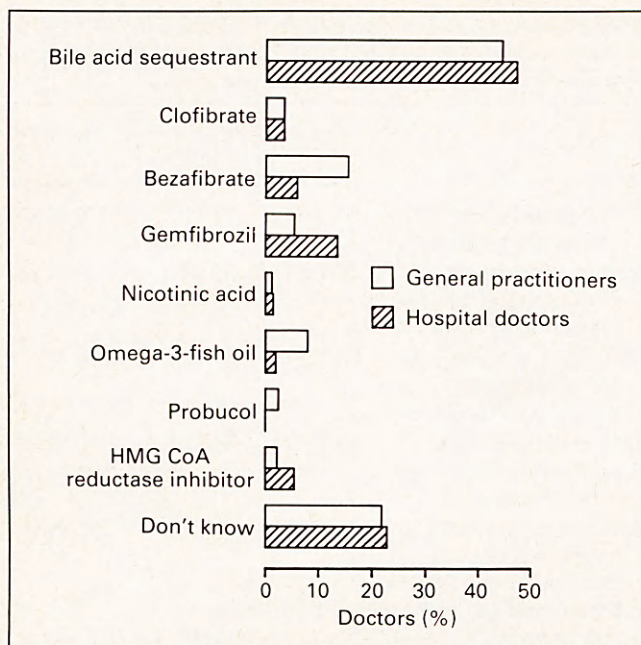


Fig. 3. Choice of first-line cholesterol lowering agents.

tors in favour of screening patients with cardiovascular risk factors but only 74% of seniors in favour. Fifteen per cent of the seniors preferred an opportunistic approach compared with only 4% of juniors.

Discussion

While there is little doubt that reduction in total serum cholesterol is accompanied by a reduction in risk of CHD [4, 5], there is debate in the UK over the most appropriate strategy to identify the hypercholesterolaemic individual [8, 12]. Extrapolation of the findings of the Scottish Heart Health Study and Scottish MONICA studies [11] indicates that 35% of UK adults aged 25–64 years have total serum cholesterol at or above 6.5 mmol/litre and 11% at or above 7.8 mmol/litre. Management of even a proportion of these would involve physicians in both primary care and hospitals and require consideration of the risk factor profile of individuals, and not just total serum cholesterol. There are serious doubts about the value of such an approach [12], not least because the intervention trials [4, 5] do not show a change in total mortality.

In this study most respondents recognised the major risk factors affecting the incidence of cardiovascular disease. They placed greater emphasis on smoking than on hypertension and raised serum cholesterol, whereas all three factors have broadly equal influence. General practitioners gave elevated cholesterol less emphasis than diabetes mellitus, and hospital doctors rated them equal despite the greater influence of an elevated serum cholesterol on the overall incidence of CHD. Two consultants attributed little importance to smoking while five considered hypertension and ele-

Table 5. Different opinions as to where the responsibility lies for using lipid lowering drugs; the figures are percentages

	Senior doctors ^a	All junior doctors
Hospital doctors	8	17
General practitioners	11	4
Lipid clinic	27	24
Hospital doctors and general practitioners	7	1
Hospital doctors and lipid clinic	13	25
General practitioners and lipid clinic	5	2
Hospital doctors and general practitioners and lipid clinic	30	26

$\chi^2 = 18.3, p < 0.05.$

^a Consultant physicians and general practitioner principals.

vated total serum cholesterol each of little or no importance. Thirteen general practitioners, of whom twelve were principals, also considered elevated serum cholesterol to be of little importance. We think it is surprising that the hospital consultants who were involved in all aspects of medicine and ten general practitioner colleagues should express such views, notwithstanding the multifactorial genesis of CHD.

LDL cholesterol was considered less important than elevated total serum cholesterol despite the former being the atherogenic lipoprotein. We believe that this probably reflects a limited appreciation of the role of LDL by the respondents; it may also be true of an understanding of the role of HDL cholesterol and serum triglycerides. However, there is continuing controversy over the importance of HDL cholesterol [13, 14] and serum triglycerides [15, 16] in CHD, which may also explain the lesser emphasis given to these factors, especially the latter. Nevertheless, recommended approaches to the management of hypercholesterolaemic patient [8, 9] include assessment of both of these factors, because intensity of treatment may be influenced by HDL cholesterol, and hypertriglyceridaemia may be a manifestation of familial combined hyperlipidaemia or remnant (type III) hyperlipidaemia, both of which are strongly associated with CHD.

The presence of further risk factors lowered the threshold at which most respondents initiated dietary therapy. However, consultants were significantly less likely than their juniors to change their threshold when there is a family history of CHD, impaired glucose tolerance, or the individual is a smoker.

Whether one considers a population or an individual approach to the problem of hypercholesterolaemia, dietary modification is the cornerstone of cholesterol reduction. Hospital doctors were much more likely than general practitioners to use the services of a dietician, although this probably reflects access to these services in Tayside. There are, however, reasons to be con-

cerned about the quality of dietetic advice given by primary health care workers, including general practitioners [17]. A quarter of our hospital doctors would not give any dietary advice themselves, relying solely on the dietician. These clinicians would then have difficulty in fulfilling an effective role in the management of hypercholesterolaemic individuals, where there is need for constant and consistent dietary advice and encouragement from all health professionals. The limited information from our dietary question (Table 4) is evidence of the difficulty that many doctors have in giving sound dietary advice. While most accepted the excessive fat intake of the British diet, there was considerable uncertainty in relation to the use of olive oil and in particular to the recommendation for polyunsaturated fat intake. In addition, a quarter of all doctors agreed with the erroneous statement that 15% calorie intake as polyunsaturated fat is recommended.

Dietary therapy of hyperlipidaemia is the keystone of successful management and may require 6–12 months of advice and encouragement of the patient to achieve maximum cholesterol reduction [8]. In addition, single results of total serum cholesterol are inadequate to establish the effect of a given intervention [18]. Despite this, 27% of respondents would introduce drug therapy after only 3 months of dietary therapy, and 40% would initiate drug therapy at or below a total serum cholesterol of 7.8 mmol/litre, notwithstanding the guideline [19] that comparatively few patients with values at this level need pharmacological intervention. The thresholds for dietary and drug treatment are similar to those found in a survey of physicians in the community in the San Francisco bay area [20]. Twenty-one of our hospital doctors would either not use drug therapy or did not know the appropriate starting levels of serum cholesterol. The same number did not know the first choice of drug they would use. A similar proportion (21%) of general practitioners had doubts about their drug of first choice, although 33% suggested that they would not start therapy. The uncertainty over drug therapy extends to our observation that a wide variety of drugs were considered first choice for cholesterol reduction. These include clofibrate, which the manufacturer does not consider to be indicated for cholesterol alone, and HMG CoA reductase inhibitors which were available only on a named basis at the time of the survey. It is likely that a number of hospital doctors as well as general practitioners are treating hypercholesterolaemia with inappropriate drugs.

Our study has revealed uncertainty among physicians on how to detect and manage hypercholesterolaemic patients. The questionnaire was phrased to determine what respondents do in practice, including the options of saying that they did not know or would not treat. For a number of reasons this approach may have led to an overestimate of the activity of doctors in relationship to management of hypercholesterolaemia, but a true view can only be determined by audit of actual practice. Bias may have been introduced due to the low response rate to the survey of about 66%,

which would also tend to overestimate the overall level of activity. There is, however, a good deal of interest in the management of hypercholesterolaemia both in hospitals and in the Tayside community, because of the presence of an active cardiovascular epidemiology unit in the region's major teaching hospital. This may have influenced the local doctors' responses and thus may not be fully representative of doctors in the United Kingdom. Moreover, the responders are also more likely to be those who are interested in the topic, and hence our results may paint a more favourable picture than is the case overall, particularly in the areas of dietetic and drug therapy knowledge. The limitation of the former supports the recommendation of expansion of dietetic services in the community [17]. In addition, it is necessary for both hospital doctors and general practitioners to improve their knowledge if they are successfully to perform the role required of them and which many appear to accept. In this respect dietitians and lipid clinic physicians have a major responsibility.

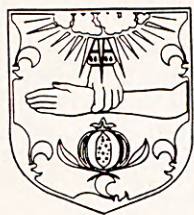
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