Efficacy of case method learning in general practice for secondary prevention in patients with coronary artery disease: randomised controlled study

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Abstract

Objective To study the efficacy of case method learning, for general practitioners, on patients' lipid concentrations in the secondary prevention of coronary artery disease.
Design Prospective controlled trial.
Setting Södertälje, Stockholm County, Sweden.
Participants 255 consecutive patients with coronary artery disease.
Intervention Guidelines were mailed to all general practitioners (n=54) and presented at a common lecture. General practitioners who were randomised to the intervention group participated in recurrent case method learning dialogues at their primary healthcare centres during a two year period. A locally well known cardiologist served as a facilitator.
Main outcome measure Concentration of low density lipoprotein cholesterol at baseline and after two years. Analysis according to intention to treat (intervention and control groups (n=88)) was based on group affiliation at baseline.
Results Low density lipoprotein cholesterol was reduced by 0.5 mmol/l (95% confidence interval 0.2 to 0.8 mmol/l) (9.3% (2.9% to 15.8%)) from baseline in patients in the intervention group and by 0.5 (0.1 to 0.9) mmol/l compared with controls ($P < 0.05$). No change occurred in the control group (0.0 (−0.2 to 0.2) mmol/l). Low density lipoprotein cholesterol decreased by 0.6 (0.4 to 0.8) mmol/l in a group of patients who received specialist care.
Conclusion Case method learning resulted in a lowering of low density lipoprotein cholesterol in the primary care patients with coronary artery disease comparable to that achieved at a specialist clinic. Conventional presentation of practice guidelines had no effect.

Introduction

Lipid lowering was shown to be efficacious in patients with coronary artery disease in 1994.[1] Despite this, a gap exists between what is achieved in clinical practice and what should be aimed for according to scientific evidence based therapeutic goals.[2] Practice guidelines have been proposed as a means to decrease such gaps,[3] but their effects have been limited.[4]

Clearly something more than just writing and distributing practice guidelines has to be done to increase knowledge and change the attitudes and performance of physicians. Practice guidelines tell you what to do but seldom how and when to do it. Furthermore, the context and content of a consultation in daily clinical practice is unstructured, unlike the strictly structured situation when a patient is enrolled in a clinical trial.[5] The frames of clinical practice decisions will thus vary from patient to patient; framing has been recognised to have a great impact on the psychology of choice.[6] A learning method suited to supporting and improving the complex clinical decision making process is needed.[7 8] Case method learning seemed to us to be an attractive method well suited to improving clinical practice.[9 10] A case is a description of an actual situation, commonly involving a decision, a challenge, an opportunity, or a problem faced by a person (or people) in an organisation. The case allows the learner to step figuratively into the position of a particular decision maker.[9 10]

Our aim was to assess whether case method learning had an effect on the cholesterol concentrations of general practitioners' patients with coronary artery disease and whether such an effect exceeded that of conventional introduction of practice guidelines. A secondary aim was to compare the effect of the intervention with what was concurrently achieved at a specialist clinic.

Methods

Study design

The aim was to study the efficacy of case method learning in general practice, on an end point at patient level, compared with the effect of distribution of guidelines and of specialist care. The local ethics committee of Karolinska Institute approved the study. Patients were unselected and had a diagnosis of coronary artery disease (see bmj.com for details). We asked patients who met the inclusion criteria for the name of the physician responsible for their care. We assigned patients who indicated a specialist physician (specialist in cardiology or internal medicine at the hospital or in private practice) to the "specialist" group (n=167) for study purposes. We studied the remaining patients (n=88) in the "control" or "intervention" group, according to

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P+ *Two additional tables, two additional figures, randomisation details, and an example case are available on bmj.com*

which group their responsible general practitioner's primary healthcare centre was subsequently randomised into (see bmj.com). The characteristics of the two groups did not differ at baseline (tables A and B on bmj.com).

The next step was to develop the first local practice guidelines on secondary prevention of coronary artery disease in this part of Stockholm County. We did this immediately after the presentation of the results of the landmark Scandinavian simvastatin survival study.[1] The guidelines were presented and distributed at a local lecture (February 1995) for all general practitioners and specialists in the catchment area. A personal letter accompanying the practice guidelines was distributed after the meeting to all relevant physicians in the catchment area.

We randomised the two primary healthcare centre clusters into control and intervention groups, after checking for balance between both patients and physicians. We offered the general practitioners in the intervention group case method learning seminars at their own primary healthcare centre. All the general practitioners accepted the invitation. We held three to four seminars at each primary healthcare centre during the two year study period. Four to seven general practitioners and one facilitator participated on each occasion (attendance rate >82%). Each seminar lasted one hour. The seminars were based on a slightly modified case method learning technique.[9 10]

During the study five patients died, three had to be excluded owing to other serious disease, eight moved out of the district, and 19 refused to participate. This resulted in 220 (86%) patients completing the two year study period (April 1997).

At the end of the study we distributed a questionnaire to all general practitioners. It included questions about knowledge and relevance of scientific evidence and practice guidelines and satisfaction with the collaboration with the local hospital.

A research nurse handled all the research protocols and contacts with the patients. She was completely blinded as to which group an individual patient belonged to. She had no contacts with the general practitioners. The general practitioners had no knowledge that they were participating in a study—this was to avoid expectancy and attention (Hawthorne) effects.[11] We did not break the code until all databases were completed and the statistical analysis had been performed.

Educational intervention

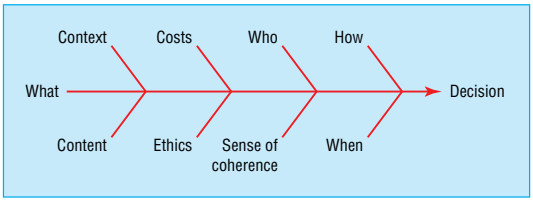
A case is a description of a defined critical situation related to the real context of a general practitioner and involving a decision. It could be about an authentic patient or a defined critical situation concerning aspects of secondary prevention in daily clinical practice and involving a decision. A case in case method learning includes analytical, conceptual, and presentation dimensions.[10] These dimensions could be divided into three levels of difficulty. Cases in clinical practice are all complex in the analytical and conceptual dimensions. There is no given obvious decision, and the sessions require that the participants have an extensive amount of knowledge and skills not supplied in the case. We kept the cases short (and well organised in the presentation dimension) because most general practitioners do not have time to prepare a case in a more traditional sense. This permitted concentration on the complex conceptual and analytical dimensions. The seminars started with the presentation of a case followed by an interactive dialogue between the participants. Active problem solving, defining, and valuing decision alternatives followed. A facilitator—a locally well known cardiologist—led the group in the interactive analytical discussion of the pros and cons and the feasibility of different potential solutions.

The figure shows a schematic cause-effect diagram of the clinical decision making process. In short, the process starts with the scientific evidence based practice guideline (what) and has to integrate individual components of the concrete and abstract frameworks of the physician and patient. The final result should be a decision to recommend or advise against an investigation, treatment, or motivational procedure for the patient. The physician's task becomes really complex when the clear structure of the practice guideline needs to be fitted into the complex world of the patient and physician.

The case method sessions included discussions of context—for example, working conditions, family situation, lifestyle, economical constraints, and social and cultural settings of both the patient and the physician. However, the most important components were abstract in nature and included the values, attitudes, beliefs, emotions, motivation, knowledge, communicative capability, and sense of coherence of both the physician and the patient.[12] The decision also included ethical aspects. Urgency and timing (when) and practical aspects (how) were subsequently discussed and analysed. The final result should be a decision. See bmj.com for a presentation of a case with examples of aspects to be discussed.

Statistical methods

The primary effect variable of the study was change in low density lipoprotein cholesterol concentration in the intervention group compared with the control group. We analysed the data according to intention to treat, depending on which group of primary healthcare centres the physician responsible for patient care belonged to at the initiation of the study, irrespective of any change during the study. To check for robustness of results in this experimental study we used analysis of variance, analysis of covariance, and nested design. We used the non-parametric Mann-Whitney U test for the ordinal data of the questionnaires. We used Statistica 6.0 (StatSoft, Tulsa, OK, USA) for statistical analysis. We present the results as means and 95% confidence intervals or medians and quartiles.



Cause-effect diagram illustrating the clinical decision making process integrating scientific evidence (what) with the concrete and abstract components of clinical practice

Table 1 Concentrations of low density lipoprotein cholesterol and total cholesterol (mmol/l) at end of study compared with baseline. Values are means (95% confidence intervals)

	Low density lipoprotein cholesterol				Total cholesterol			
Group	Baseline	Two years	Change	Change (%)	Baseline	Two years	Change	Change (%)
Intervention (n=41)	4.2 (4.0 to 4.5)	3.7 (3.4 to 4.0)	–0.5 (–0.8 to –0.2)*	–9.3 (–15.8 to –2.9)	6.3 (6.1 to 6.6)	5.8 (5.5 to 6.2)	–0.4 (–0.6 to –0.1)†	–6.0 (–10.4 to –1.5)
Control (n=37)	4.1 (3.8 to 4.4)	4.1 (3.8 to 4.4)	0.0 (–0.2 to 0.2)	0.7 (–4.1 to 5.9)	6.2 (5.9 to 6.6)	6.3 (5.9 to 6.6)	0.1 (–0.2 to 0.4)	1.8 (–2.2 to 5.9)
Specialist (n=142)	4.3 (4.1 to 4.4)	3.6 (3.4 to 3.8)	–0.6 (–0.8 to –0.4)	–12.6 (–16.1 to –9.1)	6.4 (6.2 to 6.6)	5.8 (5.6 to 6.0)	–0.5 (–0.3 to –0.6)	–7.5 (–9.8 to –5.0)

*–0.5 (–0.1 to –0.9) mmol/l compared with controls.
†–0.5 (–0.1 to –0.9) mmol/l compared with controls.

Results

As shown in table 1, low density lipoprotein cholesterol concentration decreased from 4.2 (95% confidence interval 4.0 to 4.5) mmol/l to 3.7 (3.4 to 4.0) mmol/l in the intervention group—a 9.3% (2.9% to 15.8%) change. We found no change in the control group. In the specialist group low density lipoprotein cholesterol concentration decreased from 4.3 (4.1 to 4.4) mmol/l to 3.6 (3.4 to 3.8) mmol/l—a 12.6% (9.1% to 16.1%) change. Low density lipoprotein cholesterol concentration after two years was 0.5 (0.1 to 0.9) mmol/l lower (effect size 0.56) in the intervention group than in the control group ($P < 0.05$).

General practitioners in the intervention and control groups did not differ in perceived knowledge and attitudes about secondary prevention at baseline. As shown in table 2, the general practitioners in the intervention group rated a higher perceived knowledge (P=0.007) and relevance (P=0.045) of scientific evidence and practice guidelines than controls after two years. Furthermore, we noted a higher satisfaction with the cooperation with the local hospital (P=0.004) concerning practice guidelines and policies.

Discussion

Case method learning for general practitioners resulted in a decrease in their patients' low density lipoprotein cholesterol concentrations to a degree that, according to current knowledge, should decrease mortality and morbidity in coronary artery disease.[1] Increases also occurred in the general practitioners' perceived knowledge of scientific evidence relating to secondary prevention in patients with coronary artery disease and their satisfaction with the collaboration with the local hospital.

Several explanations have been offered for the inefficiency of practice guidelines.[4 8 13–16] One is that practice guidelines are not written for practising physicians but focus on scientific knowledge.[17] In-depth interviews indicate that personal experience or the advice and recommendations of colleagues are the most important factors determining attitudes and behaviour.[18] Some authors also claim that physicians tend to disagree or distrust guidelines written by experts.[19–21] Specialists are more influenced by medical journals and scientific conferences, whereas general practitioners are more influenced by medical newspapers and postgraduate meetings.[19] Methods of changing physicians' practices have been reviewed.[14 21–23] We consider that crucial components in our intervention are the focus on the physicians' own clinical practice, the small groups, the location of the seminars at their own practice, the recurrent intervention, and that the opinion leader was just a leader of the dialogues and not a lecturer. We used case method learning because this technique focuses on decision making and is interactive.[9 10 24] A review of another learning technique—problem based learning—found only limited evidence of effects.[25] The focus on decisions in the case method and our findings should justify its further use in interventions aimed at change in clinical performance.

A difference between clinical trials and clinical practice is that patients in studies are often highly selected. A strength of our study is that the patients are consecutive—that is, they are completely unselected. A weakness inherent in pedagogical interventions and in our study is the impossibility of separating the effect of the method from that of the tutor. However, a tutor is an essential part of most learning techniques and has to be trained and fit for the role.

The results concerning lipid lowering in patients treated by specialists is in line with what would be expected.[1] That patients treated by general practitioners in the control group had no decrease of their lipid concentrations despite publication of firm scientific evidence and presentation of local practice guidelines is, however, disconcerting. An explanation could be that patients with coronary artery disease represent only a minority of patients treated at a generalist practice as opposed to a majority at a specialist clinic. Generalists are faced with the difficult task of ensuring they are updated on scientific evidence relating to all the different diseases of their patients.[17] However, a positive aspect of our study is that a mere three to four hours spent during a two year period seem to improve the quality of care of a particular patient group to a level

Table 2 Results from questionnaire on perceived knowledge and attitudes of general practitioners at end of study. A low value indicates high knowledge, relevance, or satisfaction as assessed by visual analogue scale

	Intervention group		Control group		
Question	Median (25% to 75% interval)	Quartile	Median (25% to 75% interval)	Quartile	P value*
Do you know the content of the practice guidelines?	1.4 (0.4 to 2.0)	1.6	3.2 (1.5 to 4.5)	3.0	0.007
Do you find the content of the practice guideline relevant?	1.5 (1.1 to 2.1)	1.0	2.7 (1.6 to 4.3)	2.7	0.045
Are you satisfied with the cooperation with the local hospital regarding practice guidelines and the policy of care for patients with coronary artery disease?	0.7 (0.3 to 2.0)	1.7	3.0 (2.3 to 4.8)	2.5	0.004

*Non-parametric Mann-Whitney U test.

similar to that achieved at a specialist clinic. Because of the broad spectrum of diseases in primary care, a high grade of time efficiency has to be a prerequisite. This seems to be fulfilled by the case method of learning.

To conclude, learning based on the case method for general practitioners resulted in a beneficial change in clinical practice. Conventional introduction of practice guidelines had no effect. We would strongly question the impact on patient outcome of practice guidelines in themselves and advocate complementary methods aimed at changing the attitude and behaviour of physicians.

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An anatomy of errors

He came in calmly (and went out in a huff).

I had my nose in his medical notes (first error). I did not look up as he opened the door, a missed opportunity to notice the expression on his face, the way he walked, etc (second error), or to give a welcoming smile. He told me that he had a chronic pain in his back. I told him to hurry up and take his clothes off down to his waist and get on the couch so that I could examine him (three errors in under 60 seconds).

"If that's the way you feel, doctor, I'm going." And he did, disappearing through the door. I was aghast.

"One of the great disadvantages of hurry is that it takes such a long time" (G K Chesterton in *All Things Considered*). Later, during the same surgery, one of my patients asked me: "Are you all right, doctor? You don't seem to be your normal self today." I wasn't, though I probably just murmured something vague in reply, and I may have given a wan smile.

The moment surgery ended I left with none of the usual niceties, not even looking at the home visits list for the day. My own disappearance through the door was purposeful, reflective, and anxious. My destination, the angry patient. This was an important visit, and I admit to a few nervous palpitations as I arrived at his home. His wife opened the door and smiled, which was encouraging, I thought. He was standing in their front room. I apologised to him for my rudeness and haste, no excuses. We sat down face to face. I listened to his story, giving plenty of time. We shook hands in a friendly way.

On my return to the surgery, I realised that I hadn't examined him—another error? This time it may have been due to my absent minded relief. He returned to see me a week later to tell me that his back pain had gone as mysteriously as it had come.

There was much talk in the practice about this incident, involving our trainee at the time. I think I quoted from *Zen and the Art of Motorcycle Maintenance* (Robert Pirsig): "When you hurry something, that means you no longer care about it, and want to go on to other things."

Brendan Jacobs *retired general practitioner, Nottingham*

We welcome articles up to 600 words on topics such as *A memorable patient, A paper that changed my practice, My most unfortunate mistake*, or any other piece conveying instruction, pathos, or humour. If possible the article should be supplied on a disk. Permission is needed from the patient or a relative if an identifiable patient is referred to. We also welcome contributions for "Endpieces," consisting of quotations of up to 80 words (but most are considerably shorter) from any source, ancient or modern, which have appealed to the reader.