Cardiovascular disease

Physician attitudes toward prevention and treatment

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ABSTRACT

OBJECTIVE Survey of physician attitudes toward practising cardiovascular disease prevention.

DESIGN Questionnaire administered via telecommunication from 1992 through 1994.

SETTING The FAMUS (Family Medicine, University of Sherbrooke) project, between 1992 and 1996, used weekly telecommunication to collect data from 200 general practitioners throughout the province of Quebec on cardiovascular disease risk factors and their treatment.

PARTICIPANTS Of 200 physicians contributing to the FAMUS project, 156 completed questionnaires (response rate 78%).

MAIN OUTCOME MEASURES Variations in attitudes to prevention policy and risk factor interventions.

RESULTS Survey results revealed physicians knew important risk factors for cardiovascular disease but differed in attitudes toward efficacy of treatment. Intervention to control cholesterol was thought to be very effective by 21.2% (95% confidence interval [CI] 21.2±6.4) and without effect by 10.3% (95% CI 10.3±4.8). Intervention to improve dietary habits was considered ineffective by 48.1% (95% CI 48.1±7.8). Confidence in managing risk factors varied; most respondents described themselves as only moderately skilled. A few practitioners (30.1%; 95% CI 30.1±7.2) acknowledged practice guidelines as an important source of information on which to base preventive interventions. Only 14.7% (95% CI 14.7±.5.6) of those surveyed included remuneration as contributing to their implementation of prevention activities in practice.

CONCLUSIONS Variations in physician attitudes could influence risk factor intervention. Interventions to change lifestyle are associated with uncertainty about patient compliance, efficacy of treatment, and ability to effect lifestyle changes.

RÉSUMÉ

OBJECTIF Réaliser un sondage sur l'attitude des médecins à l'endroit des pratiques de prévention des maladies cardiovasculaires.

CONCEPTION Un questionnaire administré par mode de télécommunications de 1992 jusqu'en 1994.

CONTEXTE Le projet de la médecine familiale de l'Université de Sherbrooke, réalisé entre 1992 et 1996, avait recours aux télécommunications sur une base hebdomadaire pour recueillir des données, auprès de 200 omnipraticiens de tous les coins de la province de Québec, sur les facteurs de risque de maladies cardiovasculaires et sur leur traitement.

PARTICIPANTS Des 200 médecins sollicités dans le contexte du projet, 156 ont rempli le questionnaire (taux de réponse de 78%).

PRINCIPALES MESURES DES RÉSULTATS Les variations des attitudes à l'égard de la politique de prévention et des interventions auprès des cas présentant des facteurs de risque.

RÉSULTATS Les résultats du sondage ont révélé que les médecins connaissaient les principaux facteurs de risque de maladies cardiovasculaires, mais que leurs opinions différaient sur l'efficacité de leur traitement. Les interventions visant le contrôle du cholestérol se révèlent très efficaces de l'avis de 21,2% des répondants (l'intervalle de confiance [IC] à 95% est de 21,2±à 6,4) et sans effet, dans une proportion de 10,3% (IC à 95% de 10,3±4,8). Les interventions visant à améliorer les habitudes alimentaires sont jugées sans efficacité par 48,1% des répondants (IC à 95% de 48,1±7,8). La confiance envers la capacité des répondants de traiter les facteurs de risque varie; la plupart se décrivent comme étant seulement d'une compétence moyenne à cet égard. Quelques praticiens (30,1%; IC à 95% de 30,1±7,2) ont reconnu l'utilité des guides de pratique clinique comme source importante de renseignements sur lesquels fonder leurs interventions de prévention. Seulement 14,7% (IC à 95% de 14,7±5,6) des répondants ont inclus la rémunération comme l'un des facteurs qui contribuaient à leur mise en pratique d'activités de prévention dans l'exercice de la médecine.

CONCLUSIONS Les variations observées dans les attitudes des médecins pourraient avoir une incidence sur les interventions auprès des cas présentant des facteurs de risque. Dans les interventions qui visent des changements au mode de vie se manifeste l'incertitude envers la mesure dans laquelle le patient s'y conforme, l'efficacité du traitement et la capacité de véritablement changer les habitudes de vie.

rimary care physicians, working alone or in practice groups, are called upon to carry out optimal preventive, diagnostic, and curative interventions. The need to link autonomous practitioners to provide a critical mass for practice-based research has been addressed in different ways in the last two decades, particularly by creating research networks of interested physicians.[1]

The Family Medicine, University of Sherbrooke (FAMUS) project, inaugurated during 1992 with 200 Quebec physicians, is one of the first research networks to use the power of computing, regular telecommunication, and an automatically updated central database. The first clinical application of FAMUS was cardiovascular disease prevention. Data on patient cardiovascular risk factors and physician interventions were recorded at successive patient visits, providing a longitudinal record and hence an individual model of risk factor progression and treatment response.[2]

Several individual studies over the last decade surveyed practitioners' attitudes to prevention of cardiovascular disease.[3-10] These studies examined different aspects of cardiovascular disease prevention and indicated some trends in attitudes, as well as differences between physicians in different health care systems. Our study of Quebec physicians adds to these previous studies combining several different aspects to give a current view of physician attitudes.

METHODS

Physician selection
A sample of 200 primary care physicians was selected to take part in the FAMUS project. Stratified random selection was used to ensure that all regions of Quebec were represented in the register's database in proportion to their respective population sizes and to take into account physician sex and the community in which he or she practised, whether urban or rural.[11] Type of practice, university teaching affiliation, and years of experience since completion of training were among the personal characteristics recorded for each physician but not used in the stratification procedure. Urban and rural communities

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were determined using Canadian Labour Force Survey and Canadian Health Survey methods.[12]

Questionnaire development and application
A questionnaire on attitudes was sent to participants following 6 weeks of data collection in the FAMUS project. Thirty-seven questions evaluated attitudes toward the practice of cardiovascular disease prevention, including:
- personal health practices and scientific activity (11 questions);
- the importance, effectiveness of treatment, and intervention management of individual risk factors (10 questions);
- the educational and organizational factors affecting overall effectiveness and policy of risk factor management (eight questions); and
- practice organization (eight questions; results not included).

Verification of face and content validity was undertaken by the project consultative committee, which consisted of 10 general practitioners of the Sherbrooke region whose responsibility was to review all project developments before implementation.[13-15]

Validation, analyses, and reporting
Reported results are based on 156 completed questionnaires (response rate 78%). Physicians who responded to the questionnaire were distributed as follows with respect to various grouping criteria: urban versus rural area, 65%; men versus women, 62% (68% for the provincial comparison); private practice versus hospital and CLSC, 67%; university teaching affiliation, 37%. These physicians had been in practice from 1 to 35 years with a mean of 11 years (range 5 to 19 years). This sample represented 1% of the population of Quebec family physicians and paralleled the published statistics of the total population with respect to sex distribution and mean age since qualification.[16]

Item responses included categorical judgment responses (yes or no) and ordered discrete responses (responses on a four- or five-point scale).[14] Results are presented as descriptive tables giving the distribution of physicians in the different categories involved for each item of interest. Group comparisons were performed using either the likelihood ratio test or Pearson χ^2 test for contingency tables. Subgroup differences were noted where comparisons achieved statistical significance (P value less than a fixed level of significance). The simultaneous effect of grouping

Table 1. Effect of risk factors for cardiovascular disease attributed by physicians (%)

RISK FACTOR	LARGE EFFECT	MODERATE EFFECT	LITTLE OR NO EFFECT	DON'T KNOW	N
High blood pressure	79.2	18.9	1.9	0.0	154
Elevated serum cholesterol	73.9	26.1	0.0	0.0	153
Elevated serum triglycerides	13.6	45.5	39.6	1.3	154
Overweight	24.7	62.3	12.3	0.6	154
Cigarette smoking	91.6	8.4	0.0	0.0	154
Impaired glucose tolerance	35.9	45.1	15.7	3.3	153
Sedentary lifestyle	19.5	71.4	8.4	0.6	154
Stress	16.6	62.9	19.9	0.7	151
High-fat diet	22.8	59.1	12.1	6.0	149

Table 2. Efficacy of risk factor treatment attributed by physicians (%)

RISK FACTOR TREATMENT	VERY EFFECTIVE	EFFECTIVE	INEFFECTIVE	DON'T KNOW	N
Blood pressure reduction and control	58.7	40.0	0.7	0.6	155
Serum cholesterol reduction and control	21.2	67.3	10.2	1.3	156
Weight loss	3.2	27.6	69.2	0.0	156
Blood glucose control	25.6	69.9	4.5	0.0	156
Smoking cessation or reduction	10.4	30.5	59.1	0.0	154
Increasing physical activity	6.5	34.8	58.1	0.6	155
Stress reduction	3.9	22.6	72.2	1.3	155
Improving food habits	5.8	46.1	48.1	0.0	154

criteria was tested by means of the loglinear modeling procedure for categorical variables or by logistic regression for dichotomic variables, assuming a multiple effect of the potential predictors. The problem of multiple comparisons was accounted for by means of Bonferroni correction procedures.[17-19] Analyses were performed using SPSS version 4.0; no missing data adjustment method was used.

RESULTS

Physician characteristics
When asked about their own risk factors for heart disease, 75.97% (95% CI 75.97±6.7) of physicians reported they knew their serum cholesterol level, 94.8% (95% CI 94.8±3.5) knew their blood pressure level, and 29.7% (95% CI 29.7±7.2) had smoked, although only 4.5% (95% CI 4.5±3.3) were still smoking.

Physician attitudes
Physician attitudes to the relative importance of various risk factors (**Table 1**) and physician opinions

concerning the efficacy of treatment (**Table 2**) were not identical. Tobacco, hypertension, and hypercholesterolemia were identified as the most important risk factors; treatment of the risk factors linked with lifestyle change was thought to be least effective. Urban physicians were more likely than rural physicians to believe in the efficacy of measures to obtain weight reduction (odds ratio [OR] = 2.535, P = 0.029; 95% CI 1.098 to 5.855). Although generally viewed as less important than other factors, triglyceride reduction was ascribed significantly more importance by practitioners without university teaching affiliation than by their teaching counterparts (OR = 7.6, P = 0.012, 98.3% CI 1.10 to 51.94).

Cholesterol screening and follow up
Most (86.5%) physicians (95% CI 86.5±5.4) regularly ordered cholesterol measurement as part of their initial assessment of adult patients; 13.5% (95% CI 13.5±5.4) did it sometimes. When patients have an initial cholesterol level that is satisfactory, 11.3% (95% CI 11.3±5.2) of physicians remeasure the

Table 3. Importance of lipid tests attributed by physicians (%)

LIPID TEST	VERY IMPORTANT	MODERATELY IMPORTANT	NOT VERY IMPORTANT	DON'T KNOW	N
Total cholesterol	30.3	62.0	7.7	0.0	155
HDL cholesterol	65.4	32.0	2.0	0.6	153
Apolipoprotein B	13.2	21.2	8.6	57.0	151
Apolipoprotein A1	8.1	17.6	13.5	60.8	148
Ratio of LDL to HDL cholesterol	29.3	37.4	20.4	12.9	147
Ratio of total cholesterol to HDL	47.3	37.8	12.2	2.7	148
LDL cholesterol	61.8	33.6	3.3	1.3	152
Triglycerides	10.3	32.9	53.6	3.2	155

cholesterol annually, 41.5% (95% CI 41.5±8.1) after 2 to 3 years, and 40.1% (95% CI 40.1±8.1) every 5 years. The range of attitudes concerning the importance of different lipid tests is shown in **Table 3**.

Risk factor intervention

Table 4 gives opinions on intervention thresholds according to total cholesterol level for diet and medication for a male patient aged 40 to 60 without evidence of cardiovascular disease or other predisposing risk factors. Opinions on treatment thresholds for the treatment of hypertension are summarized in **Table 5**. More agreement is evident for treatment of hypertension than for treatment of hypercholesterolemia.

For patients who smoke, 80.6% (95% CI 80.6±6.2) of physicians discuss stopping or reducing tobacco use at almost every visit. A small fraction of physicians discuss smoking only if they think the patient might be motivated to quit (8.5%, 95% CI 8.5±4.4).

Factors influencing effectiveness of preventive practices

Table 6 presents physicians' evaluation of the major factors contributing to effectiveness of cardiovascular risk management. The relationship with patients was regarded as the most important factor. Of those surveyed, 14.7% (95% CI 14.7±5.6) included remuneration as contributing to practice prevention policy while 19.9% (95% CI 19.9±6.3) considered it as detracting. About half (51.9%) of physicians (95% CI 51.9±7.8) indicated the uncertain efficacy of available interventions as another factor diminishing their effectiveness (data not given in **Table 6**).

Self-evaluation of personal skills

Results of skill self-evaluation are given in **Table 7**. Approximately 9.0% (95% CI 9.0±4.5) of physicians admitted to being "not skilled" in counseling for lifestyle changes while 6.5% (95% CI 6.5±3.9) did not evaluate their skills in this area. In subgroup analysis, male physicians expressed more confidence in drug treatment of risk factors than female physicians, (OR=6.593, P=0.015, 95% CI 1.448 to 30.011). Urban physicians expressed less confidence in their management of lifestyle interventions than their rural counterparts (OR=0.382, P=0.038, 95% CI 0.154 to 0.949). In addition, physicians with less than 10 years'

Table 4. Levels of total cholesterol at which physicians usually initiate dietary or medication therapy for men aged 40 to 60 without evidence of cardiovascular disease or additional risk factors

TOTAL CHOLESTEROL LEVEL (MMOL/L)	DIET (N = 155) % PHYSICIANS	MEDICATION (N = 152) % PHYSICIANS
≤5.1	0.6	0
5.2-5.7	32.3	0.7
5.8-6.3	36.8	3.9
6.4-6.7	22.6	21.1
6.8-7.7	5.8	38.1
7.8-8.8	0.6	16.5
≥8.9	0	5.9
Don't know	0.7	3.9
Would not initiate therapy	0.6	9.9

Table 5. Levels of blood pressure at which physicians usually initiate medication therapy for men aged 40 to 60 without evidence of cardiovascular disease or additional risk factors

BLOOD PRESSURE (MM HG)	% OF PHYSICIANS
DIASTOLIC (N = 152)	
<80	0
80-84	0
85-89	0
90-94	34.2
95-99	44.1
100-104	21.7
≥105	0
Don't know	0
Don't use diastolic as a criterion	0
SYSTOLIC (N = 155)	
<130	0
130-139	0
140-149	13.5
150-159	16.2
160-169	41.9
170-179	12.3
≥180	3.8
Don't know	0.7
Don't use systolic as a criterion	11.6

Table 6. Physicians' evaluation of factors influencing effectiveness of preventive practices

FACTOR INFLUENCING EFFECTIVENESS	N	%
Relationship with patients	156	96.7
Personal knowledge	156	77.6
Compliance of patients	156	75.0
Personal commitment	156	66.7
Efficacy of available interventions	150	50.0
Availability of time	156	41.0
Opportunity to refer	156	28.2
Organization of practice	156	25.6
Adequacy of remuneration	156	14.7
Other	156	1.3

experience seemed less confident with respect to pharmacologic treatment than those more experienced (OR=0.143, P=0.051, 95% CI 0.020 to 1.009).

Sources and categories of information

Table 8 shows the information sources on which physicians' actions and beliefs about reducing the risk of cardiovascular disease were based. Continuing medical education, professional meetings, and review articles were viewed as the most important sources of knowledge. Subgroup analysis revealed that male physicians were more inclined than female physicians to consider practice guidelines as a source of information influencing their practice policy, although guidelines are considered as an important information source by only a few of all responders (OR=2.554, P=0.025, 95% CI 1.124 to 5.804). Further, younger physicians (ie, medical experience less than 10 years) were more likely to base their actions and beliefs on residency training as a major source of information (OR=6.027, P=0.00, 95% CI 2.839 to 12.794) than those with 10 years of experience and more. Physicians with teaching positions were more likely than those without university affiliation to rely on consultation with specialists (OR=2.618, P=0.016, 95% CI 1.194 to 5.742) and review articles (OR=12.5, P=0.021, 95% CI 1.5 to 107.2) as major sources of information.

Physicians reported making available to patients information pamphlets or other written material on heart-healthy diets (86.1%, 95% CI 86.1±5.5), smoking cessation (61.0%, 95% CI 61.0±7.9), physical activity (44.4%, 95% CI 44.4±8.2), weight loss (61.1%, 95% CI 61.1±8.0 %), stress reduction (30.0%, 95% CI 30.0±7.6) and medication use (29.0%, 95% CI 29.0±7.6). The percentage of physicians using written educational material thus ranges from 29% to 86% depending on the subject matter, with a relatively high percentage of question nonresponders (3% to 12%).

DISCUSSION

Physicians' knowledge of the relative importance of risk factors accords with the current literature.[20] Quebec physicians attribute less importance to high-fat diets, obesity, stress, and sedentary lifestyles than physicians in the United States.[8] These risk factors are also subject to the greatest range of response between practitioners; 12.1% (95% CI 12.1±5.2) in our survey suggested that high-fat diets and obesity have little or no effect on cardiovascular disease.

Table 7. How physicians rate their skills in cardiovascular risk management expressed as percentage of physicians per category of skill

RISK MANAGEMENT SKILLS	VERY SKILLED	MODERATELY SKILLED	UNSKILLED	DON'T KNOW	N
Screening	36.5	62.8	0	0.7	156
Follow up individuals at risk	26.3	69.2	2.6	1.9	156
Pharmacological treatment	16.2	81.2	1.9	0.7	154
Counseling for lifestyle changes	13.5	71.0	9.0	6.5	155

In attitudes to the efficacy of treating the same risk factors, an important variation is evident. Whereas there is some consensus that treating hypertension is effective, there is a spread of opinion about treating hypercholesterolemia; 10.3% (95% CI 10.3±4.8) of practitioners consider treatment ineffective. Even greater variation appears when judging the efficacy of lifestyle changes. We observe that 48.1% (95% CI 48.1±7.9) believe that dietary change has little effect and more than half state that interventions for obesity, exercise, and smoking cessation have limited effect. These observations are similar to those reported 14 years ago.[3]

Variation of opinion relating to cholesterol screening could in part reflect varying advice in the literature. For example, Canadian guidelines on the periodic health examination suggest screening men for hypercholesterolemia between ages 30 and 59,[21-24] whereas the 1988 Canadian consensus guidelines would screen all adults after the age of 18.[25] Other recent cholesterol screening policy suggestions are much more conservative.[26,27] Surveys of physician attitudes and practices are more compatible with these more recent conservative views.[5,6,10,28,29]

We also find a wide distribution in the frequency of follow up for repeating cholesterol assessment when initial results are normal. Whereas published guidelines suggest assessment at least every 5 years,[24,30] previous attitude surveys have shown that general practitioners modify their policies according to the degree of risk.[7] The variation in attitudes to the levels of cholesterol that should trigger diet or medication intervention demonstrate a trend toward lower levels than an Ottawa-based survey published in 1989[5]; intermediate levels were recorded in a 1990 Montreal study.[7] This possible trend lags behind a similar trend observed in the United States.[9]

Analysis of factors considered important in influencing practice effectiveness shows that relationships with patients, patient compliance, and personal

Table 8. Physicians' evaluation of the major sources on which they base their actions and beliefs in reducing cardiovascular disease risk among patients expressed as percentage of physicians for each source

SOURCES OF INFORMATION	N	%
Continuing medical education courses	156	95.5
Review articles	156	87.8
Professional meetings	156	85.9
Consultation with specialists	156	46.8
Residency training	156	44.9
Results of original research	156	36.5
Practice guidelines	156	30.1
Patient requests	156	5.8
Other	156	5.8

knowledge are predominant and that organizational and financial considerations are of secondary importance. Much emphasis is placed on the role that patients must play in achieving success. One aspect is how patient education can contribute to compliance.[31]

Practice guidelines were considered a source of information by only 30.1% (95% CI 30.1±7.2) of these physicians. It is interesting to note, however, that in determining levels of treatment, most responses conform to existing guidelines. A recent study confirms variation in adoption of the Canadian Task Force on

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Key points
Family physicians in Quebec showed good knowledge of cardiac risk prevention strategies.

They varied widely, however, in their confidence that they could effectively intervene to influence patients' lifestyle choices.

RESEARCH
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the Periodic Health Examination recommendations.[21] This underlines the importance of defining the factors that will enable primary care practitioners to adopt practice guidelines.[32,33] ❖

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