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Physician and Patient Barriers to Adherence With Cholesterol Guidelines

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Abstract

Several national studies have shown poor compliance with National Cholesterol Education Program II (NCEP) goals. A study we conducted of patients in the General Internal Medicine Clinic at the Marshall University Joan C. Edwards School of Medicine in Huntington showed that 46% of them were not at NCEP goals. We hypothesized that both patient and physician barriers were responsible for these findings so we administered two surveys about barriers to cholesterol management to 261 random patients identified with hypercholesterolemia and to all 50 residents and faculty at the clinic. We identified insufficient knowledge of low cholesterol foods as a patient barrier (31.6% of patients), and inadequate time to review NCEP guidelines as a physician barrier (45.5% of physicians). We conclude that many patients in our practice lack the knowledge of what foods are low in cholesterol and that our physicians may not use the NCEP guidelines because they are inconvenient to access in our clinic. Future research should explore ways to improve patient knowledge of low cholesterol foods and accessibility of guidelines for use during patient visits.

Introduction

Studies have shown poor compliance with National Cholesterol Education Program (NCEP) guidelines (1-6). In the General Internal Medicine Clinic at Marshall University Joan C. Edwards School of Medicine, a chart review revealed that only one-half of our patients with hyperlipidemia were at the NCEP goal for low-density lipoprotein cholesterol (7). Furthermore, physicians in our study missed one-half of the opportunities to adjust cholesterol management based on lipid profiles. Although there is a body of literature on barriers to physician compliance with published guidelines (8-10), little data exist on patient barriers to cholesterol management (11). We hypothesize that patients fail to reach NCEP goals because of patient and physician barriers. Therefore, we surveyed patients and physicians in our academic general internal medicine practice to identify potential barriers to cholesterol management.

Methods

We surveyed 300 General Internal Medicine patients from our academic practice randomly selected from among those patients with an ICD-9 code of 272.0, 272.1, 272.2, 272.3, and 272.4 who received medical care between July 1996 and June 1998. This cohort of patients was used in our previous research on compliance with NCEP guidelines (7). Thirty-nine patients were excluded from analysis because of incorrect address or death of the patient, leaving an available sample size of 261. Our study was approved by the Marshall University Institutional Review Board.

Survey Development

Based on a review of the literature for barriers to compliance with cholesterol management guidelines, we developed two short surveys each each requiring about five minutes to complete. We tested the patient survey with lay staff for face validity and the physician survey with graduating residents who were not included in this study. All surveys were coded to ensure confidentiality.

The patient survey had five questions regarding knowledge and attitudes about high cholesterol, low fat diet, lipid lowering medication and bloodwork. Two questions had 5 point Likert scale answers from strongly agree to strongly disagree. Three questions were multiple choice with more than one possible selected answer. Patients were mailed the survey twice in the spring of 2001 and non-responders were contacted by phone to obtain a 60.5% response rate.

Thirty-three of 50 (66%) resident and faculty physicians in our General Internal Medicine Clinic completed the survey concerning barriers to cholesterol management. The survey comprised eight questions requiring 5 point Likert scale answers from strongly agree to strongly disagree. Questions included knowledge of and agreement with NCEP guidelines, barriers of time to check guidelines and time to counsel patients about cholesterol, attitude about the importance of cholesterol to their patients' health and comfort using medications to control cholesterol.

For data analysis, we combined the strongly agree and agree responses into one category and similarly combined strongly disagree and disagree responses. Baseline variables were compared by the Student's t test for continuous variables and chi square for categorical variables. Simple statistics were used to assess responses to the survey questions. Multiple logistic regression analysis was used to assess any affect of patient age, gender, or insurance type on responses to the survey. All analyses were performed using Stata 7.0 statistical software (College Station, TX).

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design, collection, analysis and interpretation of data, writing of the report or in the decision to submit the report for publication. The authors had full access to all of the data in the study and accept full responsibility for the integrity of the data and the accuracy of the data analysis.

Results

The 158 patients who responded to the survey comprised 40.5% males and 59.5% females with an average age of 59 years (range 30-86). The most frequent insurance coverage of responders was Medicare or commercial insurance (41.8% Medicare, 41.8% commercial insurance, 11.4% Medicaid, and 5% self-pay). Non-responders were not significantly different in gender (32.3% males and 67.7% females), but they were somewhat younger with an average age of 54 years (range 23-88). Non-responders were not significantly different compared to responders for type of insurance (43.0% commercial insurance, 40.9% Medicare, 14.0% Medicaid, and 2.1% self-pay).

Most patients (77.8%) thought they knew enough about high cholesterol to make a decision about receiving treatment and agreed (91.1%) that cholesterol was harmful to health (Table 1). Patients listed several dietary reasons as to why they did not follow a cholesterol treatment plan (Table 2), the most common being a lack of knowledge of low cholesterol foods (31.6%).

Only 21 patients (13.3%) reported a fear of medication side effects. Even though just 14 (8.9%) reported the cost of medication as a barrier, cost was a problem for 4 of the 8 uninsured patients.

Nearly one-third of our patients reported that their physician did not recommend a medication for their cholesterol. There was no significant difference in the likelihood of being on a medication when analyzed by quartiles of age. Of the 115 patients taking a medication for their cholesterol, 95 (82.6%) said they take their medication regularly. Patients infrequently cited barriers related to having bloodwork such as difficulty fasting, transportation, cost, and fear of needles. Of these items, transportation was the most common (5.1%). Using multiple logistic regression analysis, we found no significant influence of age, gender, or insurance type on patients' reponses.

Table 1. Patient Barriers — Knowledge.

	Agree N (%)	Neutral N (%)	Disagree N (%)	Missing N (%)
Know enough to make a decision about treatment	123 (77.8)	22 (13.9)	5 (3.2)	8 (5.1)
Believe cholesterol is harmful to health	144 (91.1)	8 (5.1)	0 (0)	6 (3.8)

Table 2. Patient Barriers — Diet, Medication and Bloodwork.

Diet	**N (%)***
Don't know what foods are low in cholesterol	50 (31.6)
Don't like to eat low fat diet	36 (22.8)
Can't afford to buy low fat food	31 (19.6)
Takes too long to prepare low fat meal	18 (11.4)
I eat a low fat diet	53 (33.5)
Medication	
Doctor hasn't recommended a medication	43 (27.2)
Fear of side effects	21 (13.3)
Can't afford it	14 (8.9)
Rather take herbs	9 (5.7)
Forget to take it	8 (5.1)
I take my medication regularly	95 (60.1)
Bloodwork	
Transportation	8 (5.1)
Can't afford it	7 (4.4)
Trouble fasting	4 (2.5)
Afraid of needles	3 (1.9)
No time to come fasting	2 (1.3)
I get my blood drawn when my doctor orders it	150 (94.9)

*Patients could choose more than one response in each category

Most of our resident and faculty physicians are aware of (90.9%) and agree with (75.8%) NCEP guidelines (Table 3). Fifteen physicians (45.5%) reported that they had insufficient time to review NCEP guidelines during patient visits, but most physicians did counsel patients about cholesterol (87.9%). Seven (21.2%) physicians reported cholesterol as the "least of my

patients problems." However, 28 (84.8%) felt that high cholesterol was "important to my patients' health." Although most physicians (78.8%) agreed the benefits of using medications to lower cholesterol outweighed their risks, 9 (27.3%) would hesitate to use a combination of drugs to control cholesterol.

Table 3. Physician Barriers.

	Agree N (%)	Neutral N (%)	Disagree N (%)*
Believe cholesterol is least of patients' problems	7 (21.2)	1 (3.0)	25 (75.8)
Would hesitate to use combination of drugs	9 (27.3)	3 (9.1)	21 (63.6)
Have time to check guidelines	14 (42.4)	4 (12.1)	15 (45.5)
Have time to discuss cholesterol	29 (87.9)	0 (0)	4 (12.1)
Agree with guidelines	25 (75.8)†	5 (15.1)	2 (6.1)
Believe benefit of drug outweighs risk	26 (78.8)	5 (15.1)	2 (6.1)
Believe cholesterol important to patients' health	28 (84.8)	3 (9.1)	2 (6.1)
Aware of guidelines	30 (90.9)	2 (6.1)	1 (3.0)

*Data are arranged in order of decreasing % disagree
†Data missing for one physician on this question

Discussion

The fact that 91.1% of the patients we surveyed know that high cholesterol is harmful to their health suggests that national and local education efforts to improve public awareness of the risk of high cholesterol have succeeded. Nonetheless, barriers exist in our patients' knowledge of low cholesterol foods, a finding consistent with another survey of patient dietary knowledge by Schectman et al (12).

Although the General Internal Medicine Clinic employs a dietician, some of the patients may not be able to take advantage of this resource or their physician may not refer them for dietary education. However, the survey by Schectman et al (12) indicated that prior knowledge and education level, rather than an intervention of physician or dietician counseling, were predictive of high dietary knowledge scores. Further study of educational interventions addressing diet is needed to reduce this potential barrier to cholesterol management.

Patients did not consider medication side effects to be a major barrier. The answer to that question may be different now, since four months after we conducted our survey, cerivastatin (Baycol) was removed from the U.S. market (Aug. 8, 2001) (13). In addition, patients did not consider the cost of medication as a major barrier, even for those patients with Medicare as their primary insurance; however, it may be a barrier for uninsured patients.

About one-third of our patients who had a diagnosis of hypercholesterolemia reported that their physician did not recommend drug treatment. Our study is limited since it relies on a cohort of patients with ICD-9 codes for hyperlipidemia in that some of these patients may have high total cholesterol with a favorable ratio of HDL to LDL making them ineligible for drug therapy. However, in our previous study of this same cohort of patients, we found that physicians did not aggressively change therapy in response to lipid levels that persisted above NCEP goals (7). Thus, it is likely that many of the patients not on medications should be receiving drug treatment according to the NCEP guidelines. Our findings are in line with a study of consumer attitudes on cholesterol management which was supported by the National Lipid Association indicating that physicians are conservative in prescribing lipid lowering medication. It revealed 51% of 600 moderate-risk patients reported their physicians did not recommend a cholesterol lowering medication (14).

Our physicians are generally in agreement with the NCEP guidelines; only 6.1% reported disagreement. A meta-analysis of physician compliance with guidelines by Cabana et al found on average about 10% disagreement with published guidelines (9). In addition, our survey showed that almost half of our physicians complained that the guidelines are inconvenient for use during patient encounters. Considering that the NCEP Adult Treatment Panel III guidelines are somewhat more complicated than the NCEP II guidelines, this barrier is most probably increasing in importance. We plan to evaluate the benefit of handheld computer programs that make the guidelines more accessible.

Nine (27.3%) of the physicians that we surveyed hesitate to use combinations of lipid lowering medications. More aggressive treatment of hypercholesterolemia with high doses of one medication and combinations of medications will be needed for all patients to reach NCEP goals. Multi-drug regimens have potential for serious side effects like rhabdomyolysis and many physicians may hesitate to risk harm with a preventive therapy. This barrier may be addressed as newer lipid lowering medications with fewer and less toxic side effects are developed, especially for use in combination (15).

Our study was limited by a low response rate for both patients and physicians. We attempted to improve the response rate by calling those patients who did not answer the second mailing. The addition of telephone surveys to the mailed surveys may have introduced some bias since the investigators called patients directly, although it was limited in that the physicians were not permitted to telephone their own patients. Our study is limited also as our patient population comprises primarily white Appalachians. Other investigators treating diverse populations should survey their patients about potential barriers to cholesterol management so that a better overall picture of the barriers that exist can be addressed.

Conclusion

The implications of our study are that patients may benefit from improved dietary knowledge and that physicians need a convenient way to access and use the NCEP guidelines. Moreover, physicians need increased confidence in prescribing combinations of cholesterol medications. Interventions which address these needs should lead to improved control of hypercholesterolemia and ultimately a reduction in atherosclerotic disease.

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References

1. Schectman JM, Elinsky EG, Bartman BA. Primary care clinician compliance with cholesterol treatment guidelines. *J Gen Intern Med*. 1991;6:121-125.
2. Majumdar SR, Gurwitz JH, Soumerai SB. Undertreatment of hyperlipidemia in the secondary prevention of coronary artery disease. *J Gen Intern Med*. 1999;14:711-717.
3. McBride P, Schrott HG, Plane MB, et al. Primary care practice adherence to national cholesterol education program guidelines for patients with coronary heart disease. *Arch Intern Med*. 1998;158:1238-1244.
4. Shrott HG, Bittner V, Vittinghoff E, et al. Adherence to National Cholesterol Education Program treatment goals in postmenopausal women with heart disease. *JAMA*. 1997;277:1281-1286.
5. Danias PG, O'Mahony S, Radford MJ, et al. Serum cholesterol levels are underevaluated and undertreated. *Am J Cardiol*. 1998 Jun 1; 81(11):1353-1356.
6. Pearson TA, Laurora I, Chu H, et al. The lipid treatment assessment project. *Arch Intern Med*. 2000;160:459-467.
7. King BD, Tafari B, Gress TW, et al. Adherence to National Cholesterol Education Program guidelines in a general internal medicine practice. *J Gen Intern Med*. 2000;15 Suppl 1:128.
8. Halm EA, Atlas SJ, Borowsky LH, et al. Understanding physician adherence with a pneumonia practice guideline. *Arch Intern Med*. 2000;160:98-104.
9. Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? *JAMA*. 1999;282:1458-1465.
10. Frolkis JP, Zyzanski SJ, Schwartz JM,et al. Physician noncompliance with the 1993 National Cholesterol Education Program (NCEP-ATPII) guidelines. *Circulation*. 1998;98:851-855.
11. Allen SS, Bache-Wiig ML, Hunninghake DB. Patient perceptions about the influence of cholesterol on heart disease. *Am J Prev Med*. 1992;8:30-36.
12. Schectman JM, Stoy DB, Elinsky EG. Association between physician counseling for hypercholesterolemia and patient dietary knowledge. *Am J Prev Med*. 1994;10:136-139.
13. Pasternak RC, Smith SC, Bairey-Merz CN, et al. ACC/AHA/NHLBI Clinical advisory on the use and safely of statins. *JACC*. 2002; 40:567-572.
14. Pasternak RC, McKenney JM, Brown WV, et al. Understanding physician and consumer attitudes concerning cholesterol management: results from the National Lipid Association surveys. *Am J Cardiol*. 2004;94(9A):9F-15F.
15. Gagne C, Gaudet D, Bruckert E. Efficacy and safety of ezetimibe coadministered with atorvastatin or simvastatin in patients with homozygous familial hypercholesterolemia. *Circulation*. 2002;105:2469-2475.