Can Physician Education and Support Improve Patient Management

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ABSTRACT

Background: Despite widespread use of statins, it is estimated that 40 – 50% of Canadian patients with known atherosclerotic cardiovascular disease (ASCVD) do not achieve recommended LDL-C level. We aimed to ascertain the care gap and whether the use of physician reminders imbedded in the electronic medical record (EMR) can optimize the use of second- and third-line therapy as recommended by guidelines and its impact on LDL-C goal achievement in a real-world experience.

Methods: We invited 300 physicians from our list of those known to be using Telus EMR in order to participate and share their practice level data. Physicians were asked whether they aimed to prescribe guidelines' recommended therapy in patients with LDL-C above recommended level.

Results: Of the invited physicians, 159 were recruited to participate and 140 activated their dashboard and 97 shared their practice results. There were 7,647 patients coded as ASCVD or familial hypercholesterolemia (FH) of whom 63% were male and 81% were older than 60 years of age and 49% had history of hypertension (HT), 29% diabetes, and 19% CKD. Approximately half (51%) of patients did not have the cholesterol panel results documented in EMR in the past two years. Of those with documented LDL-C, the value was above the recommended level of <2.0 mmol/L in 33% of patients; 22% had LDL-C between 2.0 and 3.0 mmol/L and 11% above 3.0 mmol/L. Among patients with LDL-C > 2.0 mmol/L, 35% were receiving no treatment, 32% were on sub-optimal dose of statin, 22% were on high intensity statin but no ezetimibe, 10% were on statin and ezetimibe, and only 1% were on PCSK9i. The most common reason for not being on any lipid lowering was patient refusal or intolerance in 47% followed by "my management is appropriate" in 32%; only in 15% of patients were there a plan to modify therapy at the next visit.

Conclusion: significant care gaps exist among primary care practices with respect to lipid lowering management with half of the patients not having the LDL-C level on the chart and of those with LDL-C, a third of patients not achieving guidelines recommended LDL-C level. Programs designed to overcome treatment inertia are needed to improve LDL-C control and achieve reduction in cardiovascular morbidity and mortality of high-risk patients.

Keywords

Introduction

Low-density lipoprotein cholesterol (LDL-C) is a well-established risk factor for cardiovascular disease (CVD) and there is considerable evidence that lowering LDL-C reduces the risk of both cardiovascular events and mortality in patients with CVD [1]. Nonetheless, strategies for lowering LDL-C are often poorly adopted in clinical practice, and many patients fail to reach guideline-recommended levels [2-10]. Thus, patients in routine practice may not receive similar benefits in cardiovascular risk reduction to that observed in clinical trials.

Although statins remain the mainstay of dyslipidemia management, attainment of the recommended LDL-C levels can be difficult without use of combination therapy [11].

In the Canadian Heart Research Centre (CHRC) Diabetes Mellitus Status in Canada (DM-SCAN) survey [12], only 57% of high CV risk patients with diabetes achieved the guideline-recommended LDL-C level < 2.0 mmol/L. Similarly, in the Canadian cohort of the DYSlipidemia International Study (DYSIS Canada), only 63% of all high CV risk patients were at recommended LDL-C levels [13]. Even in a recently completed Alberta survey, 48.5% of patients with ASCVD receiving lipid-lowering treatment, with the majority on moderate/high dose statin therapy, did not achieve an LDL-C <2.0 mmol/L [14].

The clinical implications of this type of care gap are significant and have been reported [15] providing projections for the number of cardiovascular morbidity and mortality events that can be prevented if clinical professional guidelines (CPG) are followed [16]. The CV benefit of add-on therapy for LDL-C lowering have recently been confirmed [17-19] and incorporated into the Canadian practice. We have demonstrated the feasibility of resolving the care gap in patients after acute coronary syndrome [20] and more recently in LDL-C lowering in the high-risk patients based on a clinical reminder imbedded in the patient level educational intervention [22].

Current and almost universal availability of electronic medical records (EMR) raises a possibility that the use of the EMR platform may allow identification of patients at high risk as well as those who may benefit from additional therapy. Thus, this implementation science program studied whether the use of EMR can help identify clinical inertia (care gap) and whether educational intervention based on feedback to physicians on their management of dyslipidemia at the practice level rather than patient level of intervention can support clinical decision making to achieve CPG recommended LDL-C level in high risk patients.

Methods

ADVANTAGE CV was supported by Amgen Canada as an investigator-initiated study started in 2018 and coordinated by the CHRC, an academic research and education physician organization. Data on lipid lowering management among high risk patients with either prior history of cardiovascular disease (CVD) or familial hypercholesterolemia (FH) were collected using the Telus EMR platform and compared to recommendation for management by Canadian CPG [16].

Invitations to participate were sent to 300 Canadian physicians from proprietary Canadian Heart Research Centre list of primary care physicians who were known to be on Telus platform and who participated in prior dyslipidemia - oriented data collection exercises [12,13,21].

Participating physicians were asked to share their practice level data (dashboard) to ascertain the care gap based on CPG recommended LDL-C levels and management. Physicians were alerted regarding groups of patients in their practice that were not treated according to recommendations [16] and were asked to provide reasons during one year of dashboard sharing. The primary end-point was proportion of patients treated according to CPG [16] recommendations and the secondary end-points were proportion of patients treated with lipid lowering therapy grouped as none, high intensity statin (atorvastatin 40 or 80 mg or rosuvastatin 20 or 40 mg), suboptimal statin (any statin other than high intensity), ezetimibe and any statin, and triple therapy of statin, ezetimibe, and PCSK9i, as well as the absolute and proportionate number of patients achieving the recommended LDL-C level of below 2.0 mmol/L.

Statistical Analysis

Data shared via dashboard was received on a daily basis from the start of the sharing by an individual physician and until the end of the program on April 30th 2020. Descriptive analysis was reported as frequency and percentage. No patient level data was collected.

Results

Of the invited physicians, 159 were recruited to participate and 140 activated their dashboard and 97 shared their practice results.

At the end of the program, there were 7647 patients with CVD (n=6798) or FH (n=715) or both (n=134) of whom 63% were male and 81% were older than 60 years of age with 49% having the history of hypertension, 29% diabetes, and 19% chronic kidney disease (CKD). Baseline heart rate was less than 70 bpm in 48% and 71 – 99 bpm in 49% among those with documented result on the chart; 74% of patients did not have the heart rate documented. Systolic and diastolic blood pressures were at target (< 140/90 mmHg) in 66% and 86% respectively in those with documented value; blood pressure was not documented in 37% of patients.

The cholesterol panel results such as LDL-C were not documented in 51% of patients at any point in the last 24 months. Only 3,775 patients (49%) had LDL-C recorded on the chart in the past 24 months and in these patients, LDL-C was above 2.0 mmol/L in 1240 (33%).

The breakdown of treatment used among 1240 patients with LDL-C ≥ 2.0 mmol/L is detailed in (Figure 1) and of these patients 437 (35%) were receiving no lipid lowering treatment.

The reasons physicians provided for not following the guidelines are summarized in (Figure 2). Of the 437 patients who were not on any lipid lowering therapy, 246 had responses from physicians and the most common reasons for not treating these patients were patient refusal and patient intolerance (47%) followed by physician assessment that their treatment was appropriate or that additional treatment was not needed (32%) and 15% were planning to add lipid lowering therapy at the next visit (Figure 2). Among the remaining three groups of patients who were not treated according to guidelines despite LDL-C above recommended level (those on suboptimal dose of statin, on high intensity statin but without ezetimibe, or those on statin with ezetimibe but not on PCSK9i) the most common reasons for

not following the guidelines were that management was appropriate, followed by decision to add therapy or ask for specialist involvement, followed by patient refusal (Figure 2).

Discussion

In patients with established cardiovascular disease, LDL-C lowering is one of the safest and efficient ways of lowering the risk of future cardiovascular events including cardiovascular and total mortality and myocardial infarction and stroke. Lowering of LDL-C by 1 mmol/L results in 20% reduction in cardiovascular mortality and 12% reduction in total mortality as well as 22% reduction in other cardiovascular events over five years [1]. We have previously documented the benefit of an algorithmic approach towards LDL-C lowering with the addition of ezetimibe [21] and more recently with the patient level improvement in the care gap based on CPG recommendations [22].
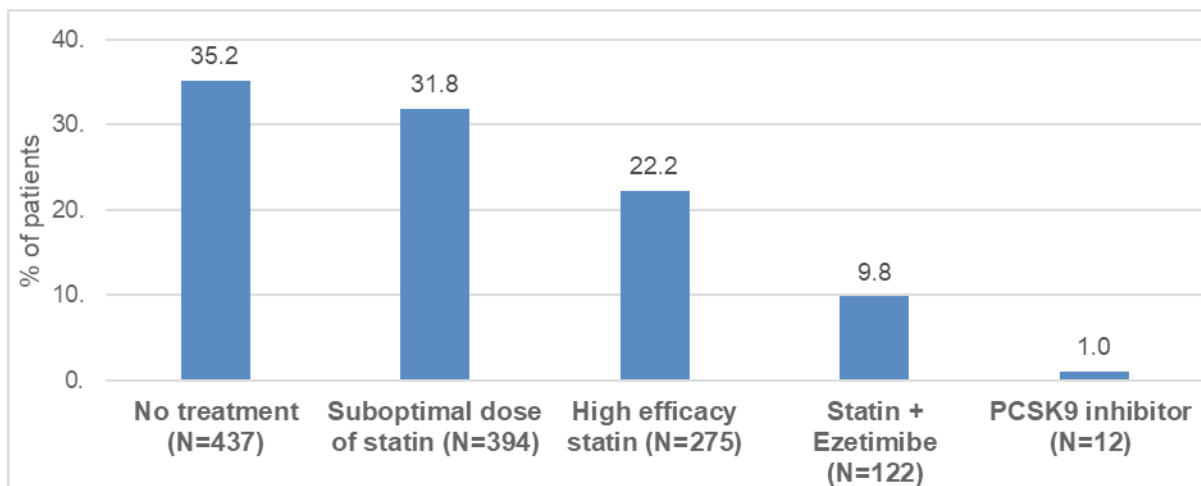

Figure 1: Recommended lipid lowering therapy among 1240 (33% of total sample) patients with LDL > 2 mmol/L (i.e. above recommended level).
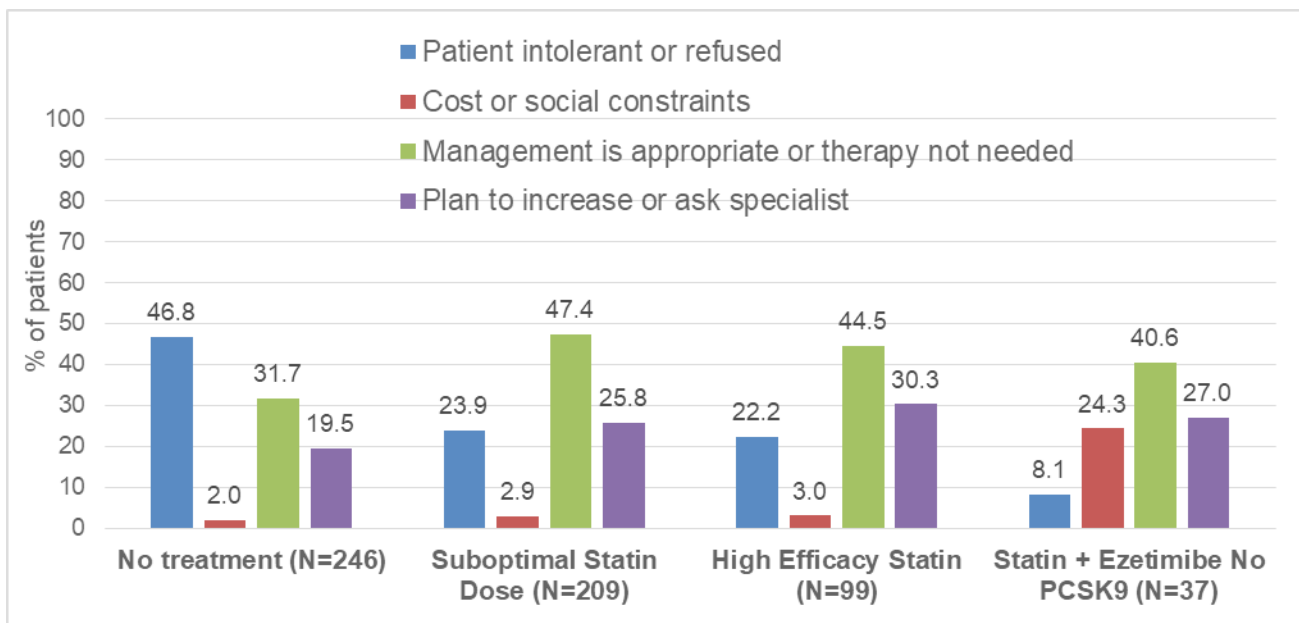

Figure 2: Reasons for not following guidelines for lipid lowering recommendations

To our knowledge this is the first Canadian experience in quality improvement measures involving lipid lowering in high risk patients that has utilized the EMR platform. In this study we identified two care gaps that are unique to the EMR platform and have not been previously described. Firstly, half of the patients did not have the LDL-C level documented in the EMR over a 24-month period for reasons that are not clear. The proportion is much lower with respect to absence of blood pressure (37%) but not absence of heart rate (74%) suggesting that this care gap is not unique to LDL-C. While it is possible that the analytical capability of the EMR platform did not capture all of the available data, recent experience from Ontario, Canada revealed that 48% of patients following percutaneous coronary intervention (PCI) did not have an LDL-C documented on the chart [23].

Secondly, among approximately a third of patients who did not achieve the CPG recommended LDL-C level of < 2.0 mmol/L (primary end point) and less than third were on recommended therapy and another third were on no lipid lowering therapy. These observations were once again supported by recent publication [23].

The etiology of treatment inertia is multi-factorial including several patient and physician associated factors [24]. We and others [15,25,26] have demonstrated that treatment inertia is associated with unfavourable outcome. The results of this program indicate that both, gap in knowledge (e.g. no treatment) and action gap (e.g. "I have not yet but will prescribe") are present (Figure 2). Most patients with LDL-C above the recommended level were not on high intensity statin recommended by the guidelines [16] or were not on any documented lipid lowering therapy. This care gap highlights the need for implementation science programs and the need for additional education since these responses from physicians clearly indicate presence of some knowledge gap in actual risk evaluation and its applicability to lipid lowering management.

Limitations

This study provided descriptive analysis of practice level data from participating physicians who were not chosen randomly and this selection bias limits generalizability of our findings. Furthermore the use of a single EMR platform may have contributed not only to the bias in physician selection but also in the care gap findings with respect to LDL-C reporting and its management.

In summary, significant care gaps exist among primary care practices with respect to lipid lowering management with half of the patients not having the LDL-C level on the chart and of those with LDL-C, a third of patients not achieving guidelines recommended LDL-C level. Programs designed to overcome treatment inertia are needed to improve LDL-C control and achieve reduction in cardiovascular morbidity and mortality of high-risk patients.

Disclosures

Acknowledgements

References

1. Baigent C, Keech A, Kearney PM, et al. Cholesterol Treatment Trialists (CTT) Collaborators. Intensity and safety of cholesterol-lowering treatment: prospective meta-analysis of data from 90,056 participants in 14 randomised trials of statins. Lancet. 2005; 366: 1267-1278.

2. Pearson TA, Laurora I, Chu H, et al. The Lipid Treatment Assessment Project (L-TAP): a multicenter survey to evaluate the percentages of dyslipidemic patients receiving lipid-lowering therapy and achieving low density lipoprotein cholesterol goals. Arch Intern Med. 2000; 160: 459-467.

3. Waters DD, Brotons C, Chiang CW, et al. Lipid Treatment Assessment Project 2: Amultinational survey to evaluate the proportion of patients achieving low-density lipoprotein cholesterol goals. Circulation. 2009; 120: 28-34.

4. Saposnik G, Goodman SG, Leiter LA, et al. applying the evidence: Do patients with stroke, coronary artery disease, or both achieve similar treatment goals? Stroke. 2009; 40: 1417-1424.

5. Hackam DG, Leiter LA, Yan AT, et al. Missed opportunities for secondary prevention of cardiovascular disease in Canada. Can J Cardiol. 2007; 23: 1124-1130.

6. Yan AT, Yan RT, and Tan M, et al. Contemporary management

of dyslipidemia in high-risk patients: targets still not met. Am J Med. 2006; 119: 676-683.

7. Banegas JR, Vegazo O, Serrano P, et al. The gap between dyslipidemia control perceived by physicians and objective control patterns in Spain. Atherosclerosis. 2006; 188: 420-424.

8. Ko DT, Mamdani M, Alter DA. Lipid-lowering therapy with statins in high risk elderly patients: the treatment-risk paradox. JAMA. 2004; 291: 1864-1970.

9. Petrella RJ, Merikle E, Jones J. Prevalence and treatment of dyslipidemia in Canadian primary care: a retrospective cohort analysis. Clin Ther. 2007; 29: 742-750.

10. Rapezzi C, Biagini E, Bellis P, et al. Exploring the gap between National Cholesterol Education Program guidelines and clinical practice in secondary care: results of a cross-sectional study involving over 10 000 patients followed in different specialty settings across Italy. J Cardiovasc Med. 2008; 9: 878-887.

11. Martineau P, Gaw A, De Teresa E, et al. Effect of individualizing starting doses of a statin according to baseline LDL-cholesterol levels on achieving cholesterol targets: the Achieve Cholesterol Targets Fast with Atorvastatin Stratified Titration (ACTFAST) study. Atherosclerosis. 2007; 191: 135-146.

12. Leiter LA, Berard L, Bowering K, et al. Type 2 Diabetes Mellitus Management in Canada: Is It Improving? Can J Diabetes. 2013; 37: 82-89.

13. Goodman SG, Langer A, Bastien NR, et al. Prevalence of dyslipidemia in statin treated patients in Canada: results of the Dyslipidemia International Study (DYSIS). Can J Cardiol. 2010; 26: 330- 335.

14. Chen G, Farris MS, Cowling T, et al. Treatment and Low-Density Lipoprotein Cholesterol Management in Patients Diagnosed With Clinical Atherosclerotic Cardiovascular Disease in Alberta. Can J Cardiol. 2019; 35: 884-891.

15. Grima DT, Leiter LA, Goodman SG, et al. How Many Cardio vascular Events Can Be Prevented with Optimal Management of High-Risk Canadians? Can J Cardiol. 2008; 24: 363-368.

16. Anderson TJ, Gregoire J, Pearson GJ, et al. 2016 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult. Can J Cardiol. 2016; 32: 1263-1282.

17. Cannon CP, Blazing MA, Giugliano RP, et al. Ezetimibe added to statin therapy after acute coronary syndromes. The New England journal of medicine. 2015.

18. Sabatine MS, Giugliano RP, Keech AC, et al. Evolocumab and Clinical Outcomes in Patients with Cardiovascular Disease. N Engl J Med. 2017; 376: 1713-1722.

19. Schwartz GG, Szarek M, Bhatt DL, et al. The ODYSSEY OUTCOMES Trial: Topline Results. Alirocumab in Patients after Acute Coronary Syndrome. Presented at the American College of Cardiology Annual Scientific Sessions March 10, 2018.

20. Langer A, Tan M, Cieza T, et al. Can Clinical Reminder Help Optimize the Use of Secondary Prevention Therapies in Non-ST Elevation Acute Coronary Syndrome? Int J Cardiol Cardiovasc Med. 2017; 1: 1-5.

21. Katz PM, Mendelsohn AA, Goodman SG, et al. Use of a Treatment Optimization Algorithm Involving Statin-Ezetimibe Combination Aids in Achievement of Guideline-Based Low-Density Lipoprotein Targets in Patients With Dyslipidemia at High Vascular Risk Guideline-Based Undertaking to Improve Dyslipidemia Management in Canada (GUIDANC). Can J of Cardiol. 2011; 27: 138-145.

22. Langer A, Tan M, Goodman SG, et al. GOAL Canada: Physician Education and Support Can Improve Patient Management. CJC Open. 2020; 2: 49-54.

23. Sud M, Han L, Koh M. Low-Density Lipoprotein Cholesterol and Adverse Cardiovascular Events after Percutaneous Coronary Intervention. J Am Coll Cardiol. 2020; 76: 1440-1450.

24. Tsang JLY, Mendelsohn A, Tan M, et al. Discordance between physicians' estimation of patient cardiovascular risk and use of evidence-based medical therapy. Am J Cardiol. 2008; 102: 1142-1145.

25. Rogers AM, Ramanath VS, Grzybowski M, et al The association between guideline-based treatment instructions at the point of discharge and lower 1-year mortality in Medicare patients after acute myocardial infarction: the American College of Cardiology's Guidelines Applied in Practice (GAP) initiative in Michigan. Am Heart J. 2007; 154: 461-469.

26. Arnold SV, Spertus JA, Masoudi FA, et al. Beyond Medication Prescription as Performance Measures. J Am Coll Cardiol. 2013; 62: 1791-1801.