Putting cardiovascular risk into perspective: A view from a pharmacist patient

Tom Smiley, BScPhm, PharmD

Introduction

The Framingham Risk Score (FRS) is the gold standard for assessing cardiovascular (CV) risk.¹ Individuals are categorized as having 10-year risk for CV disease event (myocardial infarction, stroke, peripheral arterial disease, congestive heart failure) that is low (0%–10%), moderate (11%–19%) or high ($\geq 20\%$) based on risk factors that include age, sex, total cholesterol, high-density lipoprotein cholesterol, smoking status and systolic blood pressure. Those with diagnosed coronary artery disease (CAD), cerebrovascular disease, peripheral arterial disease or heart failure (HF) are automatically deemed to have a high 10-year risk.¹ While the FRS is a useful clinical tool, it should be noted that it underestimates risk in certain categories of patients: in younger individuals, women, individuals with metabolic syndrome and those with chronic kidney disease.¹ In addition, family history (evidence of CV disease in a first-degree relative younger than 60 years) is associated with a 1.7- and 2-fold increased risk of CV disease for women and men, respectively, which is not taken into account in the FRS. This factor helps to explain why 10% to 15% of patients with CAD have no apparent major CAD risk factors.¹ As such, family history must be considered when assessing CV disease risk.

Health professionals and patients may be much less concerned about individuals with low or moderate risk compared with those at high risk, and therefore may be less likely to recommend healthy lifestyle changes or medications. Moreover, in this population of patients, diagnoses such as angina may not be

considered as often when the most remarkable complaints are symptoms such as excessive shortness of breath on exertion.

This autobiographical case underscores the importance of heeding symptoms that may be suggestive of CV disease, regardless of risk assessment estimates. In addition, patients should be educated to appreciate the fact that low to moderate CV risk estimates do not imply that healthy lifestyle strategies are any less desirable.

Description of case

The events described in this case took place when I was 57 years old, with a 10-year FRS of 13.3%. I played tennis regularly and was an active individual but began experiencing excessive shortness of breath while playing singles tennis in the summer of 2011. I had a body mass index of 25 kg/m², average blood pressure (135/85 mmHg not treated) and blood glucose in the normal range. I had never smoked but did have a family history of CV disease. My mother was diagnosed with HF in her early 60s and died at age 70. My father was diagnosed with type 2 diabetes at approximately 55 years of age and died as a result of an abdominal aortic aneurysm at age 65. Previous lipid panel levels had not indicated that pharmacological treatment was required according to current Canadian guidelines.¹ However, a lipid panel conducted the month before symptoms were reported revealed an low-density lipoprotein (LDL) cholesterol level of 3.94 mmol/L (treatment is indicated at LDL cholesterol levels of 3.5 mmol/L or higher for individuals at moderate CV risk).¹ I was prescribed rosuvastatin 10 mg daily.

The episodes of shortness of breath I experienced were more pronounced on some occasions than others but were not evident when playing less strenuous doubles tennis. In January 2012, I began to experience episodes of shortness of breath with a discomfort felt across the upper back, even when playing doubles tennis. The discomfort dissipated after a short period of rest (approximately 1 minute or less). This feeling would occur on some occasions but not others. I attributed a worsening of shortness of breath in March and April 2012 to springtime allergies and asthma that I had suffered earlier in life. However, in consultation with my family physician, a cardiologist appointment was deemed necessary to rule out CV causes (scheduled for early May 2012). I was still in denial about this potential diagnosis but thought it best to attend the cardiology appointment as requested. In the meantime, allergy testing confirmed multiple spring allergies (trees, pollens, grasses). Twice-daily budesonide/formoterol inhalation was prescribed. I obtained minimal relief from inhalation of the corticosteroid/long-acting beta-agonist, and symptoms continued to worsen to the point that walking for more than approximately 5 minutes, or walking that involved inclines, posed a problem with respect to increasing respiratory symptoms and discomfort (always relieved by rest). I began to consider that I might be experiencing stable angina but continued to hope that my symptoms could be a result of respiratory problems. At the cardiology appointment in early May 2012, my cardiologist strongly recommended that I be referred directly for an angiogram instead of opting for a stress test, as the symptoms were strongly suggestive of stable angina, and stress tests are not always conclusive. He prescribed enteric-coated acetylsalicylic acid (EC ASA) 81 mg daily but was hesitant to prescribe a beta-blocker due to potential asthma complications. I was also prescribed a short-acting nitroglycerin spray in case angina symptoms that were not relieved by short periods of rest should arise. I was booked for an angiogram in 4 weeks' time.

On May 14, 2012, I received a phone call asking if I would be interested in an angiogram appointment that had become available in several days. I agreed, as symptoms appeared to be worsening. Upon arrival at the appointment, I was given a loading dose of clopidogrel 600 mg. Access to the heart was gained through the radial

artery at the wrist. During the procedure, the interventional cardiologist informed me that the left anterior descending artery was 90% occluded and asked permission to insert 2 drug-eluting (sirolimus) stents, due to the length of diseased artery that was involved. I agreed, and the stents were placed immediately.

After the procedure, I was prescribed clopidogrel 75 mg daily, EC ASA 81 mg daily, metoprolol 25 mg twice daily, ramipril 5 mg once daily and rosuvastatin 10 mg daily. Over the first week, I was quite fatigued as I adjusted to medications, and my pulse declined to 50 beats per minute or less at times, with a blood pressure averaging approximately 115/75 mmHg. I was feeling frustrated that someone at relatively low CV risk like myself would be in this circumstance. In consultation with my family physician, I reduced my morning dose of metoprolol to 12.5 mg. I set up a weekly pill reminder and reflected on how I never expected to be in this situation. On several occasions, I considered not taking my clopidogrel and ASA doses due to acid reflux issues but did not give in to the temptation. It struck me that an individual who had not been sufficiently educated about the importance of taking these medications might not have been adherent at this point. Three weeks after the intervention, most of my previous level of energy had returned. Two months later, I was back to normal activity levels, including strenuous sports, with no adverse symptoms. My LDL cholesterol has declined to 1.04 mmol/L (previously 3.94 mmol/L) with rosuvastatin treatment and loss of 5 kg, accomplished by cutting down on food portions.

Discussion

There is no denying that CV risk assessment tools provide an evidence-based means for communication of risk to the patient, as well as assessment of eligibility for treatments such as cholesterol-lowering agents. Studies such as the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP) and SCRIP-*plus* have confirmed that a large care gap currently exists in screening of patients and that pharmacist assessment and intervention can make a significant difference in helping patients at moderate to high risk reduce their chances of experiencing myocardial infarction, stroke or other CAD-related events.^{2,3} However, what message should a patient receive when CV assessment results indicate low to moderate risk of CV events?

Many people with CAD do not have the classic risk factors and would be otherwise deemed low to moderate risk. In a study of 80,000 individuals admitted to an emergency room because of acute coronary ischemia, almost 20% did not have any of the 4 major risk factors for coronary artery disease (smoking, hypertension, high cholesterol, diabetes).⁴ Over 60% of men and 50% of women presented with 1 or fewer of these risk factors. Moreover, in a 26-year follow-up of the Framingham Heart Study, 35% of coronary artery disease occurred in people with below-average total cholesterol (<5.2 mmol/L).⁵ Recent hypotheses evolving from studies such as the JUPITER (Justification for the Use of Statins in Primary Prevention: An Intervention Trial Evaluating Rosuvastatin) trial have cited the role of arterial inflammation in the progression of atherosclerosis as a potential reason for CAD events occurring in people with average or below-average levels of cholesterol.⁶ In addition, individuals with higher levels of arterial inflammation are deemed to be at higher risk for coronary events secondary to rupture of the fibrous cap that covers atherosclerotic plaque.⁷

We must be mindful that family history of CV events (first-degree relative with CV disease before age 60) approximately doubles CV risk.¹ Patients should always be asked about family history when discussing CV risk. However, as in my circumstances, it may not be possible to ascertain exactly when a particular first-degree relative (i.e., my father) was first affected by CV disease. It is important not to dismiss the potential for increased CV risk on the basis that an individual was not diagnosed before age 60. The Reynolds Risk Score is an example of a CV risk assessment tool that takes both arterial inflammation (as assessed by high-sensitivity C-reactive protein [hsCRP] levels) and family history into account.¹

It is clear that CV risk assessment is not a “perfect” science and that health professionals and patients alike should be mindful that not all risk factors are taken into account. It is also important to understand that angina can present in many different ways. The Heart & Stroke Foundation describes possible symptoms of angina as follows⁸:

- Pain that starts in the centre of the chest but spreads to the left arm, back, throat or jaw

- Tightness, pressure, squeezing and/or aching feeling in the chest or arm(s)
- Feeling of moderate to severe indigestion that is persistent
- Sharp, burning or cramping pain
- An ache starting in, or spreading to, the neck, jaw, throat, shoulder, back or arm(s)
- Discomfort in the neck or upper back, particularly between the shoulder blades*
- Increased shortness of breath on exercise*
- Numbness or a loss of feeling in the arms, shoulders or wrists

*These symptoms were the ones most consistent with my experience.

Stable angina occurs in a predictable manner and happens at about the same point when exercising or under emotional stress.⁸ It is usually relieved with rest or nitroglycerin. Unstable angina involves chest pain that is unexpected and may occur at rest.⁸ Any chest pain that is not expected should be medically investigated immediately.

When discussing health with a patient, healthy lifestyle choices should be encouraged regardless of risk assessment results. Studies have shown that even people at low CV risk benefit from further risk reduction when engaging in heart-healthy strategies.⁶

This case offers the perspective of a health professional transitioning quickly to the role of patient. From this “patient’s” perspective, the challenge of becoming accustomed to taking a number of new medications is a real one, in terms of both physical and mental adjustment. In this case, part of the challenge was lack of energy caused by a sudden lowering of heart rate and blood pressure. This underscores the importance of follow-up from the pharmacist to assure the patient that the body will adjust to the new circumstances. Additional side effects should be queried and action plans discussed.

Conclusion

While CV risk assessment tools allow for objective assessment of a patient’s CV risk, they should not be used in place of a thorough assessment of patient symptoms. These symptoms can vary from crushing pain that starts in the centre of the chest and radiates out the left arm, back and jaw to shortness of breath on exertion and/or relatively mild discomfort in the back or neck. Moreover, all patients, including those who consider themselves to be

at low risk for CV disease, should be educated to act immediately when experiencing signs and symptoms suggestive of CV disease. All individuals should be encouraged to engage in a heart-healthy lifestyle regardless of assessed baseline CV risk. Pharmacists have an important

role to play in encouraging healthy lifestyle in all individuals and in putting CV risk assessment results into appropriate context for the patient. The importance of follow-up with patients receiving new medications has also been underscored in this case.■

From Pharmavision Health Consulting Inc., Paris, Ontario. Contact phvision@sympatico.ca.

References

1. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult—2009 recommendations. *Can J Cardiol* 2009;25:567-79.
2. Tsuyuki RT, Johnson JA, Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Arch Intern Med* 2002;162:1149-55.
3. Tsuyuki RT, Olson KL, Dubyk AM, et al. Effect of community pharmacist intervention on cholesterol levels in patients at high risk of cardiovascular events: the Second Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP-plus). *Am J Med* 2004;116:130-3.
4. Khot UN, Khot MB, Bajzer CT, et al. Prevalence of conventional risk factors in patients with coronary heart disease. *JAMA* 2003;290:898-904.
5. Castelli WP. Lipids, risk factors and ischaemic heart disease. *Atherosclerosis* 1996;124(Suppl):S1-S9.
6. Ridker PM, Danielson E, Fonseca FA, et al. Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. *N Engl J Med* 2008;359:2195-207.
7. Bisoendial RJ, Kastelein JJ, Stroes ES. C-reactive protein and atherogenesis: from fatty streak to clinical event. *Atherosclerosis* 2007;195:e10-e18.
8. Heart & Stroke Foundation. Angina. Available: www.heartandstroke.com/site/c.ikIQLcMWJtE/b.3484055/k.52CA/Heart_disease__Angina.htm (accessed Oct. 23, 2012).