Assessment of cardiovascular risk in primary care

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A 41 year-old Caucasian gentleman presented to his general practitioner (GP) for a routine blood pressure (BP) check. The patient was asymptomatic and had an initial reading of 154/115mmHg. Ambulatory BP monitoring (ABPM) was requested, revealing a subsequent reading of 137/89mmHg.

Further assessment was arranged; including an ECG (no R wave progression or large P waves), total cholesterol 6.8mmol/L (reference <5mmol/L), and a fundoscopy examination revealed no silver wiring or other abnormalities. There was no evidence of urinary microalbuminuria.

He consumes a moderate amount of alcohol on weekends only, and smokes 10 cigarettes a day. He has a medical history of depression and dyspepsia for which he takes omeprazole and sertraline daily. He has no family history of cardiovascular disease (CVD).

His QRISK2 score was calculated as 10.3%. He was concerned about what this meant for his health and wanted help in making decisions about how to proceed.

Question 1 - **Which guidelines and tools could be used to help facilitate a discussion that leads to a shared decision with the patient?**

Short Answer

The UK National Institute for Health and Care Excellence (NICE) has developed a clinical guideline (CG181, published in 2014) on lipid modification for primary and secondary prevention of CVD[1].

Patient decision aids (PDA) are valuable tools that present evidence-based estimates of the risks and benefits of treatment options to help facilitate shared, patient-focused decision making.

Long Answer

The NICE guideline offers evidence-based advice and recommendations on the treatment of people currently with, or at risk, of CVD. Other international equivalent guidelines from the European Society of Cardiology (ESC) and the American College of Cardiology (ACC) also provide robust guidance tailored to their respective populations[2,3].

Shared decision making (SDM) is an increasingly important concept in healthcare[4]. It refers to a collaborative process whereby health care decisions are made jointly by individuals and their clinicians, taking into account the best scientific evidence available as well as values and preferences. PDAs are an important means to support this process and seek to give individuals clear information about the benefits and risks of proposed interventions and treatments[5]. Unlike the generic background information provided by patient information leaflets, they aim to supplement the interaction between healthcare professionals and individuals[6]. A recent Cochrane review concluded that PDAs increase patients' involvement in decisions about their care and improve their knowledge; though there is uncertainty about the effectiveness of strategies to improve their adoption, given the low quality of evidence[7].

NICE have developed a PDA on taking statins alongside their professional guidelines on lipid modification in CVD[8,9]. The ESC and ACC guidelines also place an emphasis on shared decision making[2,3].

PDAs present relative and absolute risks in context for patients to better understand the benefit or harm that an intervention, or lack thereof, may bring. They can also provide illustrations that portray information in an accessible format.

Randomised controlled trials have shown that these tools promote dialogue and increase joint deliberation[10]. They also pivot the focus of consultations towards patients as the data is reviewed[11]. The evidence suggests they do not increase the uptake of therapy overall and indeed, may do the opposite[12].

Patients should be informed about the limitations of CVD risk assessment tools, which can only provide an approximate value of risk and may misclassify high risk status on an individual level[13].

It should be noted that not all patients will value involvement in making decisions about their health, nor be able to understand the information that is presented to them[14]. Patients should be offered a choice on what they feel comfortable with, as many will simply want clear advice[15].

Equally, some patients may take their own initiative with self-assessment tools available online. Healthcare professionals should consider counselling patients on the use of these tools, as unexpected or contradictory results may be misunderstood or disregarded[16].

Question 2 - **What are the important principles of lifestyle advice to deliver?**

Short Answer

The NICE guideline CG181 recommends that following CVD risk assessment, lifestyle modification benefits should be discussed with the patient before offering any pharmacological treatment for primary prevention. This should include diet, physical activity, smoking and alcohol consumption.

Long Answer

Risk Assessment

When performing risk assessment, the latest NICE guideline recommends using the QRISK2 tool to assess CVD risk for primary prevention of CVD in patients up to and including 84 years of age[1,17]. QRISK2 is considered better calibrated for UK CVD event rates than other tools. The Framingham risk tool, for example, is based on USA prospective cohort studies and is widely used in other countries. The NICE guidance advises that patients should not be opportunistically assessed; those over the age of 40 should have their CVD risk reviewed on an annual basis, with priority for a formal review if their QRISK2 is more than 10%.

The most important principle is to encourage individuals to participate in reducing their CVD risk. This involves ascertaining any prior knowledge and feelings about their health. Confidence, readiness for change and health beliefs must also be explored, as these will attitudes to changing lifestyle[18]. Decisions should be made in partnership with the patient and clinicians should check if the management plan has been fully agreed.

Lifestyle Advice

In general, individuals should be encouraged to optimise their diet and physical activity, stop smoking, and moderate their alcohol consumption. Dietary advice should focus on a balanced diet and the NHS Choices website offers many suggestions on healthy cooking methods[19]. Although some reports have advocated the Mediterranean diet as a preferred choice as it is supported by trial evidence, the NICE guidelines did not use the term 'Mediterranean' in their recommendations, concerned about confusion as to how this term might be interpreted, and potential adverse economic effects for those with limited budgets. [1,20,21,22]. Nevertheless, many of the components of the 'Mediterranean diet' are incorporated into the general NICE dietary advice: eating at least 5 portions of fruit and vegetables a day; preferring wholegrain options for starchy foods; reducing sugar intake; having at least 2 portions of fish per week and 4-5 portions of unsalted nuts, seeds and legumes per week.

Patients at high risk or pre-existing CVD should have a diet where 30% or less of energy intake comes from fat, and should avoid saturated fats where possible.

Salt intake should also be monitored, as reducing this can help to ameliorate elevated blood pressure[23].

Individual circumstances should be taken into consideration and patients should be encouraged to have a healthy approach to changing their behaviour in relation to food. In line with NICE's recommendations on obesity, weight management is also vital, and patients who are overweight should have discussions about maintaining a healthy weight and be supported and guided to appropriate services to facilitate this[24].

Any advice on physical activity should also take into account the patient's circumstances and preferences, particularly with respect to co-morbidities and mobility. NICE recommends that these patients should follow the national guidance for physical activity in the general population[1]. High-risk individuals who are capable should aim for at least 150 minutes of moderate exercise per week, or 75 minutes of vigorous exercise; or a combination of both[25]. It is also recommended that muscle-strengthening activities in major muscles groups are also carried out.

Alcohol should be moderated to 3-4 units/day for men and 2-3/day for women, with avoidance of heavy 'binge' drinking where possible. It is particularly important to address the issue of smoking, as in many cases including this one, smoking cessation is likely to be one of the most effective interventions to improve the overall CVD risk profile [26]. The NHS Stop Smoking Services offer an intensive support service for people looking to stop smoking and depending on assessment of nicotine dependence, pharmacotherapy and behavioural interventions (or a combination of both) may be considered[27].

Question 3 **– Is pharmacological therapy indicated in this patient?**

Short Answer

The ABPM reading of 137/89 represents uncomplicated stage 1 hypertension and drug treatment is not indicated according to current NICE guidance. Although the CVD risk is over 10% and NICE guidance suggests statin treatment can be considered in this range, an initial period of supported lifestyle modification should be offered to the patient at this stage.

Long Answer

The patient's initial blood pressure reading was 154/115mmHg with a subsequent ABPM reading of 137/89mmHg. According to current NICE guidance (CG127), if the diastolic reading continued to be greater than 110mmHg, the patient would be classified as having severe hypertension and antihypertensive medication would be warranted[23]. Given the physiological variability of blood pressure, ABPM is recommended to give a more accurate diagnosis and in particularly, negate the 'white coat' effect. This was appropriately organised for this patient and the result of 137/89mmHg represents uncomplicated (low risk of CVD) stage 1 hypertension[25]. The ESC and ACC recommend starting pharmacological therapy for uncomplicated stage 1 hypertension, whereas NICE and the National Heart Foundation of Australia suggest educating patients on lifestyle advice rather than initially considering pharmacological options[28].

Lifestyle interventions are the overriding priority for this patient and will be the mainstay of the current management approach. If, after a period of lifestyle modification, the 10-year CVD risk continues to be above 10% using the QRISK2 assessment tool, a statin may be offered. Any such decision to start treatment in the future should be taken in collaboration with the patient, and the job of the doctor would be to help share knowledge about the best available evidence of risks and benefits.

The NICE lipid guideline (CG181) suggests that when a decision has jointly been made to commence statin therapy for the primary prevention of CVD, atorvastatin 20mg once daily should be the routine choice. However, for patients with pre-existing cardiovascular disease, a higher dose of 80mg is indicated.

Statins are one of the commonest drugs prescribed in the NHS[29]. Despite their widespread use and tolerability, they have been associated with a variety of adverse effects. Myalgia is particularly commonly reported and it is therefore important to ask about generalised, unexplained muscle pains before commencing treatment[1]. If present, creatine kinase levels should be checked and this is also the test of choice in individuals who develop symptoms whilst taking statins[1]. There is also an elevated risk of developing type 2 diabetes whilst on statin therapy, although a meta-analysis of statin trials revealed that treating around 255 patients with statins for 4 years results in one extra case of diabetes[30]. Counselling about the possibility of developing these unintended affects is therefore an important aspect of discussions about initiation.

In cases where CVD risk is at a level where intervention is warranted but an individual chooses not to commence treatment, they should be advised that their CVD risk should be reassessed again in the future[1].

ESC guidelines recommend the use of the SCORE system to measure CVD risk[31]. Like NICE, they advise using a threshold of 10% to consider initiating pharmacological treatment and concur with the recommendations suggesting an initial period of lifestyle intervention[2]. ACC guidelines, meanwhile, suggest the use of race and sex-specific pooled cohort equations[32]. They suggest the initiation of statin therapy in primary prevention patients with a predicted 10-year risk of greater than or equal to 7·5%, and consideration of statin therapy in patients with 10-year risks of between 5% and 7·5%[33].

Question 4 **– When would referral to secondary care be warranted?**

Short Answer

Where the total cholesterol is >9.0mmol/L, or non-high density lipoprotein (HDL)-cholesterol concentration >7.5mmol/L, a referral to a specialist secondary care service is indicated. This also applies if the triglyceride concentration is >20mmol/L and not due to poor glycaemic control or excess alcohol[1]. A specialist evaluation for secondary causes of hypertension and potential target organ damage can be considered.

Long Answer

The vast majority of CVD risk management can be successfully looked after in primary care, however where appropriate, specialist lipid services should be utilised where the lipid management can be optimised and CVD risk further reduced[34]. It should be noted that common secondary causes of dyslipidaemia should be excluded before a referral is made. These include; uncontrolled diabetes, hypothyroidism, liver disease, excess alcohol and nephrotic syndrome[1].

Patients should be asked to provide a full lipid profile (a fasting sample is not needed); total cholesterol, (HDL)-cholesterol, non-HDL-cholesterol, and triglyceride concentrations, before commencing lipid modification therapy. Familial hypercholesterolaemia should be suspected if the total cholesterol is greater than 7.5 mmol/L and if the patient has a family history of premature coronary heart disease[1].

A repeat fasting triglyceride concentration is recommended if an initial triglyceride count is 10-20mmol/L, within a two week period but after five days. One should seek specialist advice if the triglyceride concentration remains above 10mmol/L.

The NICE guidelines encourage consideration of secondary causes of hypertension in those under 40 with stage 1 hypertension and no evidence of CVD, target organ damage, renal pathology or diabetes mellitus. A more detailed assessment of potential target organ damage should be undertaken as 10-year risk assessments in such people can underestimate the lifetime risk of cardiovascular events in this cohort[23].

Patient outcome

The GP and patient had a discussion as to what the QRISK2 score means and the implications of this on the future health of the patient. The options of reducing his risk were explored; namely, lifestyle modifications and the use of statin therapy.

After consideration, and an initial attempt at lifestyle measures, the patient opted for pharmacological therapy to further reduce his CVD risk through a PDA and external reading, and was subsequently commenced on atorvastatin 20mg once daily.

He has not suffered side effects of statin therapy and remains to be compliant with his medication. He is also aware of the importance of continuing to actively make lifestyle changes for improving his hypertension and improving his overall cardiovascular risk.

[1] National Institute for Health and Care Excellence. Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease. (Clinical guideline 181.) 2014

[2] Perk, J., De Backer, G., Gohlke, H., Graham, I., Reiner, Ž., Verschuren, M., ... & Baigent, C. (2012). European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). *European heart journal*, *33*(13), 1635-1701.

[3] Goff, D. C., Lloyd-Jones, D. M., Bennett, G., O'Donnell, C. J., Coady, S., & Robinson, J. (2014). 2013 ACC/AHA guideline on the assessment of cardiovascular risk. *J Am Coll Cardiol*.

[4] Elwyn G, Frosch D, Thomson R et al. Shared decision making: a model for clinical practice. J Gen Intern Med. 2012 Oct;27(10):1361-7.

[5] Agoritsas T, Heen AF, Brandt L et al. Decision aids that really promote shared decision making: the pace quickens. BMJ. 2015 Feb 10;350:g7624.

[6] Volk RJ, Llewellyn-Thomas H, Stacey D, Elwyn G. Ten years of the International Patient Decision Aid Standards Collaboration: evolution of the core dimensions for assessing the quality of patient decision aids. BMC Med Inform Decis Mak. 2013;13 Suppl 2:S1.

[7] Stacey D, Bennett CL, Barry MJ, Col NF, Eden KB, Holmes-Rovner M, Llewellyn-Thomas H, Lyddiatt A, Légaré F, Thomson R. Decision aids for people facing health treatment or screening decisions. Cochrane Database of Systematic Reviews 2011, Issue 10. Art. No.: CD001431. DOI: 10.1002/14651858.CD001431.pub3

[8] NICE (2014) Taking a statin to reduce the risk of coronary heart disease and stroke. Accessed: https://www.nice.org.uk/guidance/cg181/resources/cg181-lipid-modification-update-patient-decision-aid2

[9] Rabar Silvia, Harker Martin, O'Flynn Norma, Wierzbicki Anthony S. Lipid modification and cardiovascular risk assessment for the primary and secondary prevention of cardiovascular disease: summary of updated NICE guidance BMJ 2014; 349 :g4356

[10] Coylewright M, Branda M, Inselman JW, Shah N, Hess E, LeBlanc A, et al. Impact of sociodemographic patient characteristics on the efficacy of decision aids: a patient-level meta-analysis of 7 randomized trials. Circ Cardiovasc Qual Outcomes 2014;7:360-7

[11] Wyatt KD, Branda ME, Anderson RT, Pencille LJ, Montori VM, Hess EP, et al. Peering into the black box: a meta-analysis of how clinicians use decision aids during clinical encounters. Implement Sci 2014;9:26

[12] Mann, D. M., Ponieman, D., Montori, V. M., Arciniega, J., & McGinn, T. (2010). The Statin Choice decision aid in primary care: a randomized trial. *Patient education and counseling*, *80*(1), 138-140.

[13] Staa T.-P.V., Gulliford M., Ng E.S.-W., Goldacre B., Smeeth L. Prediction of Cardiovascular Risk Using Framingham, ASSIGN and QRISK2: How Well Do They Predict Individual Rather than Population Risk? PLoS One. 2014;9:1–10

[14] van den Brink-Muinen A, van Dulmen SM, de Haes HC, et al. Has patients' involvement in the decision-making process changed over time? Health Expect 2006; 9(4): 333–342.

[15] Elwyn G, Edwards A, Kinnersley P, Grol R. Shared decision making and the concept of equipoise: the competences of involving patients in healthcare choices. Br J Gen Pract 2000; 50(460): 892–897

[16] Bonner C, Jansen J, Newell BR, et al. I don't believe it, but I'd better do something about it: patient experiences of online heart age risk calculators. J Med Internet Res 2014; DOI: 10.2196/jmir.3190

[17] Hippisley-Cox J, Coupland C, Vinogradova Y, Robson J, Minhas R, Sheikh A et al. Predicting cardiovascular risk in England and Wales: prospective derivation and validation of QRISK2 BMJ 2008; 336 :1475

[18] Prochaska, JO; Velicer, WF. The transtheoretical model of health behavior change. Am J Health Promot 1997 Sep–Oct;12(1):38–48

[19] NHS Choices: Healthy Recipes available at: http://www.nhs.uk/Livewell/healthy-recipes/Pages/Healthy-recipes.aspx

[20] Singh RB, Dubnov G, Niaz MA, Ghosh S, Singh R, Rastogi SS et al. Effect of an IndoMediterranean diet on progression of coronary artery disease in high risk patients (IndoMediterranean Diet Heart Study): A randomised single-blind trial. Lancet. 2002; 360(9344):1455-1461

[21] de Lorgeril M, Salen P, Martin JL, Monjaud I, Delaye J, Mamelle N. Mediterranean diet, traditional risk factors, and the rate of cardiovascular complications after myocardial infarction: final report of the Lyon Diet Heart Study. Circulation. 1999; 99(6):779-785

[22] Estruch R, Ros E, Salas-Salvadó J, Covas MI, Corella D, Arós F et al.. Primary prevention of cardiovascular disease with a Mediterranean diet. N Engl J Med. 2013; 368:1279-90

[23] National Institute for Health and Care Excellence. Hypertension: Clinical management of primary hypertension in adults (Clinical guideline 127.) 2011

[24] National Institute for Health and Care Excellence. Obesity: Guidance on the prevention of overweight and obesity in adults and children (Clinical guidance 43.) 2006

[25] NHS Choices: Physical activity guidelines for adults available at http://www.nhs.uk/Livewell/fitness/Pages/physical-activity-guidelines-for-adults.aspx

[26] Teo KK, Ounpuu S, Hawken S, Pandev MR, Valentin V, Hunt D, Diaz R, Rashed W, Freeman R, Jiang L, Zhang X, Yusuf S; INTERHEART Study Investigators. Tobacco use and risk of myocardial infarction in 52 countries in the INTERHEART study: a case-control study. Lancet 2006;368:647-658

[27] NHS Stop Smoking available at: http://www.nhs.uk/livewell/smoking/Pages/stopsmokingnewhome.aspx

[28] Sheppard JP, Fletcher K, McManus RJ et al. Prevalence and costs of treating uncomplicated stage 1 hypertension in primary care: a cross-sectional analysis. Br J Gen Pract 2014; 64(627).

[29] Goldacre Ben, Smeeth Liam. Mass treatment with statins BMJ 2014; 349 :g4745

[30] Sattar, Naveed, et al. "Statins and risk of incident diabetes: a collaborative meta-analysis of randomised statin trials." The Lancet 375.9716 (2010): 735-742.

[31] Conroy RM, Pyorala K, Fitzgerald AP, Sans S, Menotti A, DeBacker G, ., SCORE project group. Estimation of ten-year risk of fatal cardiovascular disease in Europe: The SCORE project. Eur Heart Journal. 2003;24:987–1003.

[32] NJU Stone, J Robinson, AH Lichtenstein, et al.
2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines
J Am Coll Cardiol (2013)

[33] Ridker PM, Cook NR. Statins: new American guidelines for prevention of cardiovascular disease. Lancet. 2013 Nov 30;382(9907):1762-5.

[34] Martin SC, Viljoen A. The value of a specialist lipid clinic. Int J Clin Pract 2008;62(6):961-6