ENDGAMES

CASE REVIEW

Assessment of cardiovascular risk in primary care

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A 41 year old white man presented to his general practitioner for a routine blood pressure check. He was asymptomatic and had an initial reading of 154/115 mm Hg. Subsequent ambulatory blood pressure monitoring (ABPM) showed that the average daytime reading was 137/89 mm Hg.

On further assessment he had no evidence of left ventricular hypertrophy on electrocardiography, and no silver wiring or other abnormalities were found on funduscopy. Laboratory tests showed total cholesterol 6.8 mmol/L (reference range <5 mmol/L), triglycerides 5.9 mmol/L (0.45-1.69), high density lipoprotein (HDL)-cholesterol 0.76 mmol/L (>1). There was no evidence of urinary microalbuminuria.

He drank a moderate amount of alcohol at weekends only and smoked 10 cigarettes a day. He had a medical history of depression and dyspepsia for which he took sertraline and omeprazole daily. He had no family history of cardiovascular disease (CVD).

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

Questions

1. Which guidelines and tools could help facilitate a discussion that leads to shared decision making with the patient?
2. What are the important principles of lifestyle advice to deliver?
3. Is drug treatment indicated in this patient?
4. When is referral to secondary care warranted?

Answers

1.

Which guidelines and tools could help facilitate a discussion that leads to shared decision making with the patient?

Short answer

The National Institute for Health and Care Excellence (NICE) has developed a clinical guideline (CG181) on lipid modification for primary and secondary prevention of CVD.[1] Patient decision aids present evidence based estimates of the risks and benefits of treatment options to help facilitate shared patient focused decision making.

Discussion

The NICE guideline offers evidence based advice and recommendations on the treatment of people currently with, or at risk of, CVD. International 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 is an increasingly important concept in healthcare.[4] It refers to a collaborative process whereby healthcare decisions are made jointly by patients and their clinicians, taking into account the best scientific evidence available as well as values and preferences. Patient decision aids are an important means to support this process and to provide people with 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 individual patients.[6] A recent Cochrane review concluded that patient decision aids increase patients' involvement in decisions about their care and improve their knowledge, although the effectiveness of strategies to improve their adoption is uncertain, given the low quality of evidence.[7]

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NICE has developed a patient decision aid on taking statins alongside its professional guidelines on lipid modification in CVD.[8][9] The ESC and ACC guidelines also place an emphasis on shared decision making.[2][3]

Patient decision aids present relative and absolute risks in context, so that patients can better understand the benefit or harm that an intervention, or the lack of one, may bring. They 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 focus the consultation towards the patient as the data are reviewed.[11] Evidence suggests that they do not increase the uptake of therapy overall and may do the opposite.[12]

Patients should be informed about the limitations of CVD risk assessment tools, which provide only an approximate value of risk and may misclassify high risk status at an individual level. CVD risk tools are not appropriate for patients with pre-existing conditions such as type 1 diabetes, chronic kidney disease, familial hyperlipidaemia, and microalbuminia.[13]

Not all patients will want to be involved in making decisions about their health or be able to understand the information that is presented to them.[14] Patients should be offered a choice on what they feel comfortable with—many will simply want clear advice.[15]

By contrast, some patients may use self assessment tools available online. Healthcare professionals should consider counselling patients on the use of these tools because unexpected or contradictory results may be misunderstood or disregarded.[16]

2.
What are the important principles of lifestyle advice to deliver?

Short answer

NICE guideline CG181 recommends discussing the benefits of lifestyle modification with the patient before offering drugs for primary prevention of CVD. This should include diet, physical activity, smoking, and alcohol consumption.

Discussion

When performing risk assessment, the latest NICE guideline recommends using the QRISK2 tool to assess the risk of CVD for primary prevention in patients ≤84 years of age.[1][17] QRISK2 is an algorithm that calculates the likelihood of a CVD event in the next 10 years using validated risk factors. It is considered better calibrated for UK CVD event rates than other tools, such as the Framingham risk tool, which is based on data from US prospective cohort studies and is widely used in other countries. The NICE guidance advises that patients should not be opportunistically assessed. However, electronic primary care records may be used to prioritise patients for review; those over the age of 40 should have their CVD risk assessed on an ongoing basis; those with a QRISK2 of more than 10% should be prioritised for a formal review. Because absolute risk may be underestimated in younger people, clinicians should consider the use of the JBS3 (Joint British Societies' consensus recommendations for the prevention of cardiovascular disease) risk calculator, which provides estimates of lifetime risk and allows for a discussion on the potential benefits of risk factor modification.[18]

The most important principle is to encourage people to participate in reducing their risk of CVD. This involves ascertaining any knowledge and feelings about their health.

Confidence, readiness for change, and health beliefs must also be explored because these will affect attitudes to lifestyle changes.[19] Decisions should be made in partnership with the patient, and clinicians should check whether the management plan has been fully agreed.

In general, people 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.[20] Although some reports have advocated the "Mediterranean" diet as a preferred choice because it is supported by trial evidence, the NICE guidelines do not use this term because of confusion about how it might be interpreted and potential adverse economic effects for those with limited budgets.[1-23] Nevertheless, many of the components of this diet are incorporated into NICE's general dietary advice: eating at least five portions of fruit and vegetables a day; replacing starchy foods with wholegrain options; reducing sugar intake; and eating at least two portions of fish and four to five portions of unsalted nuts, seeds, and legumes a week.

Patients at high risk and those with pre-existing CVD should avoid saturated fats where possible and 30% or less of their energy intake should come from fat.

Salt intake should also be monitored and kept at 5-6 g per day, because reducing salt can help to reduce high blood pressure.[24][25]

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 achieving and maintaining a healthy weight and be supported and guided to appropriate services to facilitate this.[26]

Any advice on physical activity should also take into account the patient's circumstances and preferences, particularly with respect to comorbidities and mobility. NICE recommends that patients should follow the national guidance for physical activity in the general population.[1] People at high risk of CVD who are capable should aim for at least 150 minutes of moderate exercise a week, or 75 minutes of vigorous exercise; or a combination of both.[27] Exercises that strengthen major muscles groups are also recommended.

Alcohol should be moderated to 3 units a day for men and 2 units a day for women, with avoidance of heavy "binge" drinking where possible.[28] It is particularly important to deal with the problem of smoking because in many cases smoking cessation is one of the most effective interventions to improve the overall CVD risk profile.[29] The NHS Stop Smoking Services offer an intensive support service for people who are trying to quit, and depending on the assessment of nicotine dependence, pharmacotherapy and behavioural interventions (or a combination of both) may be considered.[30]

3.
Is drug treatment indicated in this patient?

Short answer

His ABPM reading represents uncomplicated stage 1 hypertension and drug treatment is not indicated according to current NICE guidance. His CVD risk is >10% and NICE guidance suggests considering statin treatment in this range, but an initial period of supported lifestyle modification should be offered first.

Discussion

ABPM provides a more accurate diagnosis because of the physiological variability of blood pressure and because it negates the "white coat" effect. If ABPM is not tolerated, home blood pressure monitoring is a suitable alternative to confirm hypertension, with blood pressure recorded twice a day for seven days.[24] International guidelines vary in their recommendations for starting drugs in stage 1 hypertension, owing to differences in interpretation of the limited evidence base in this population and differences in emphasis on cost effectiveness.[31]

Lifestyle interventions are the over-riding priority for patients with a QRISK2 score just over 10% and are the mainstay of management. If, after a period of lifestyle modification, the 10 year risk of CVD 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 doctor's job is to help share knowledge about the best available evidence of risks and benefits.

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

Statins are one of the most common types of drug prescribed in the NHS.[32] Despite their widespread use and tolerability, they have been associated with a variety of adverse effects. Myalgia is commonly reported so it is important to ask about generalised, unexplained muscle pains before the patient starts treatment.[1] If such pains are present, creatine kinase levels should be checked; this is also the test of choice in people who develop symptoms while taking statins.[1] There is also an increased risk of developing type 2 diabetes while taking statins, although a meta-analysis of statin trials found just one extra case of diabetes in 255 patients treated with statins for four years.[33] Counselling about the possibility of developing these unintended effects is an important part of discussions about treatment.

Advise patients who choose not to start statins, even though their CVD risk is at a level where intervention is warranted, that their CVD risk should be reassessed in the future.[1]

ESC guidelines recommend the use of the SCORE system and low density lipoprotein levels to measure the risk of CVD.[34] Both the NICE and ESC guidelines advise using a threshold of 10% with their respective scoring systems to consider starting drug 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.[35] They suggest starting statins for primary prevention in patients with a predicted 10 year risk of ≥7.5% and consideration of statins in those with a 10 year risk of 5-7.5%.[36]

4.
When is referral to secondary care warranted?
Short answer

When total cholesterol is >9.0 mmol/L or non-HDL-cholesterol is >7.5 mmol/L. Urgent specialist review is warranted if triglycerides are >20 mmol/L (not as a result of poor glycaemic control or excess alcohol).[1] Specialist evaluation for secondary causes of hypertension and potential target organ damage can be considered.

Discussion

CVD risk can mostly be managed in primary care, but specialist lipid services should be used to optimise treatment and CVD reduce risk further if appropriate.[37] Common secondary causes of dyslipidaemia should be excluded before a referral is made. These include uncontrolled diabetes, hypothyroidism, liver disease, excess alcohol intake, and nephrotic syndrome.[1]

A full lipid profile—total cholesterol, HDL-cholesterol, non-HDL-cholesterol, and triglyceride concentrations—should be measured before statins are started; a fasting sample is not needed. Familial hypercholesterolaemia should be suspected if total cholesterol is >7.5 mmol/L and there is a family history of premature coronary heart disease.[1]

A fasting triglyceride concentration is recommended only if the initial triglyceride concentration is 10-20 mmol/L. It should be measured within two weeks but after five days. Seek specialist advice if the patient's fasting triglyceride concentration remains above10 mmol/L.

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

Patient outcome

The GP and patient discussed what the QRISK2 score means and the implications for the patient's future health. The options for reducing his risk—lifestyle modifications and treatment with statins—were explored.

After consideration and an initial attempt at lifestyle measures, the patient opted for drug treatment to reduce his risk of CVD. This decision was influenced by the use of a patient decision aid and his personal research, and he was started on atorvastatin 20 mg once daily.

He has had no adverse effects and remains compliant with his treatment. He is aware of the importance of continuing to make lifestyle changes to improve his hypertension and 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. https://www.nice.org.uk/guidance/cg181.

2 Perk J, De Backer G, Gohlke H, et al. European Association for Cardiovascular Prevention & Rehabilitation (EACPR) ESC Committee for Practice Guidelines (CPG). European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). *Eur Heart J* 2012;33:1635-701. doi:10.1093/eurheartj/ehs092 pmid:22555213.

3 Goff DC Jr, , Lloyd-Jones DM, Bennett G, et al. American College of Cardiology/American Heart Association Task Force on Practice Guidelines. 2013 ACC/AHA guideline on the assessment of cardiovascular risk. *J Am Coll Cardiol* 2014;63(suppl 2):2935-59. doi:10.1016/j.jacc.2013.11.005 pmid:24239921.

4 Elwyn G, Frosch D, Thomson R, et al. Shared decision making: a model for clinical practice. *J Gen Intern Med* 2012;27:1361-7. doi:10.1007/s11606-012-2077-6 pmid:22618581.

5 Agoritsas T, Heen AF, Brandt L, et al. Decision aids that really promote shared decision making: the pace quickens. *BMJ* 2015;350:g7624. doi:10.1136/bmj.g7624 pmid:25670178.

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.pmid: 24624947.

7   Stacey D, Bennett CL, Barry MJ, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev* 2011;10:CD001431.pmid:21975733.

8   National Institute for Health and Care Excellence. Taking a statin to reduce the risk of coronary heart disease and stroke. 2014. https://www.nice.org.uk/guidance/cg181/resources/cg181-lipid-modification-update-patient-decision-aid2.

9   Rabar S, Harker M, O'Flynn N, Wierzbicki AS. Guideline Development Group. Lipid modification and cardiovascular risk assessment for the primary and secondary prevention of cardiovascular disease: summary of updated NICE guidance. *BMJ* 2014;349:g4356. doi:10.1136/bmj.g4356 pmid:25035388.

10 Coylewright M, Branda M, Inselman JW, 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. doi:10.1161/HCQ. 0000000000000006 pmid:24823953.

11 Wyatt KD, Branda ME, Anderson RT, et al. Peering into the black box: a meta-analysis of how clinicians use decision aids during clinical encounters. *Implement Sci* 2014;9:26. doi:10.1186/1748-5908-9-26 pmid:24559190.

12 Mann DM, Ponieman D, Montori VM, Arciniega J, McGinn T. The Statin Choice decision aid in primary care: a randomized trial. *Patient Educ Couns* 2010;80:138-40. doi:10.1016/j.pec.2009.10.008 pmid:19959322.

13 van Staa TP, Gulliford M, Ng ES-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:e106455. doi:10.1371/journal.pone.0106455 pmid: 25271417.

14 van den Brink-Muinen A, van Dulmen SM, de Haes HC, Visser AP, Schellevis FG, Bensing JM. Has patients' involvement in the decision-making process changed over time?*Health Expect* 2006;9:333-42. doi:10.1111/j.1369-7625.2006.00413.x pmid:17083560.

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;50:892-9.pmid:11141876.

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;16:e120. doi:10.2196/jmir.3190 pmid:24797339.

17 Hippisley-Cox J, Coupland C, Vinogradova Y, et al. Predicting cardiovascular risk in England and Wales: prospective derivation and validation of QRISK2. *BMJ* 2008;336:1475-82. doi:10.1136/bmj.39609.449676.25 pmid:18573856.

18 JBS3 Board. Joint British Societies' consensus recommendations for the prevention of cardiovascular disease (JBS3). *Heart* 2014;100(Suppl 2):ii1-67. doi:10.1136/heartjnl-2014-305693 pmid:24667225.

19 Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot* 1997;12:38-48. doi:10.4278/0890-1171-12.1.38 pmid:10170434.

20 NHS Choices: Healthy recipes. http://www.nhs.uk/Livewell/healthy-recipes/Pages/Healthy-recipes.aspx

21 Singh RB, Dubnov G, Niaz MA, et al. Effect of an Indo-Mediterranean diet on progression of coronary artery disease in high risk patients (Indo-Mediterranean Diet Heart Study): a randomised single-blind trial. *Lancet* 2002;360:1455-61. doi:10.1016/S0140-6736(02)11472-3 pmid:12433513.

22 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;99:779-85. doi:10.1161/01.CIR.99.6.779 pmid:9989963.

23 Estruch R, Ros E, Salas-Salvadó J, et al. PREDIMED Study Investigators. Primary prevention of cardiovascular disease with a Mediterranean diet. *N Engl J Med* 2013;368:1279-90. doi:10.1056/NEJMoa1200303 pmid:23432189.

24 National Institute for Health and Care Excellence. Hypertension: clinical management of primary hypertension in adults (Clinical guideline 127.) 2011. https://www.nice.org.uk/guidance/cg127.

25 Mancia G, Fagard R, Narkiewicz K, et al. Task Force Members. 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens* 2013;31:1281-357. doi:10.1097/01.hjh. 0000431740.32696.cc pmid:23817082.

26 National Institute for Health and Care Excellence. Obesity: guidance on the prevention of overweight and obesity in adults and children (Clinical guidance 43.) 2006. https://www.nice.org.uk/guidance/cg43.

27 Choices NHS. Physical activity guidelines for adults. http://www.nhs.uk/Livewell/fitness/Pages/physical-activity-guidelines-for-adults.aspx.

28 NHS Change4Life: Alcohol units and guidelines. http://www.nhs.uk/Change4Life/Pages/alcohol-lower-risk-guidelines-units.aspx.

29 Teo KK, Ounpuu S, Hawken S, et al. INTERHEART Study Investigators. Tobacco use and risk of myocardial infarction in 52 countries in the INTERHEART study: a case-control study. *Lancet* 2006;368:647-58. doi:10.1016/S0140-6736(06)69249-0 pmid:16920470.

30 Stop Smoking NHS. http://www.nhs.uk/livewell/smoking/Pages/stopsmokingnewhome.aspx.

31 Sheppard JP, Fletcher K, McManus RJ, Mant J. Prevalence and costs of treating uncomplicated stage 1 hypertension in primary care: a cross-sectional analysis. *Br J Gen Pract* 2014;64:e641-8. doi:10.3399/bjgp14X681817 pmid:25267050.

32 Goldacre B, Smeeth L. Mass treatment with statins. *BMJ* 2014;349:g4745. doi:10.1136/bmj.g4745 pmid:25056140.

33 Sattar N, Preiss D, Murray HM, et al. Statins and risk of incident diabetes: a collaborative meta-analysis of randomised statin trials. *Lancet* 2010;375:735-42. doi:10.1016/S0140-6736(09)61965-6 pmid:20167359.

34 Conroy RM, Pyörälä K, Fitzgerald AP, et al. SCORE project group. Estimation of ten-year risk of fatal cardiovascular disease in Europe: the SCORE project. *Eur Heart J* 2003;24:987-1003. doi:10.1016/S0195-668X(03)00114-3 pmid:12788299.

35 Stone NJU, Robinson JG, Lichtenstein AH, et al. American College of Cardiology/American Heart Association Task Force on Practice Guidelines. 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* 2014;63(25 Pt B):2889-934. doi:10.1016/j.jacc. 2013.11.002 pmid:24239923.

36 Ridker PM, Cook NR. Statins: new American guidelines for prevention of cardiovascular disease. *Lancet* 2013;382:1762-5. doi:10.1016/S0140-6736(13)62388-0 pmid:24268611.

37 Martin SC, Viljoen A. The value of a specialist lipid clinic. *Int J Clin Pract* 2008;62:961-6. doi:10.1111/j.1742-1241.2007.01667.x pmid:18201180.