UPDATE
Module 1648

This module covers:

- The risk of morbidity and mortality following a myocardial infarction
- The different treatment options that may be considered for secondary prevention of myocardial infarction
- The key lifestyle advice and medicines management tips you can offer patients who have experienced a myocardial infarction

MARCH

Cardiovascular month

Statins: six case studies	March 2
Myocardial infarction 1	March 9
Myocardial infarction 2	March 16
Hypertension	March 30

Myocardial infarction: part 2

Doreen Cochrane

About 1.2 million people in the UK have had a myocardial infarction (MI) at some point in their lives.[1] An MI is caused by necrosis of heart muscle due to ischaemia and can occur if the coronary artery is completely blocked (ST segment elevation myocardial infarction or STEMI); or partially blocked (non-ST segment elevation myocardial infarction or NSTEMI). In these, the heart is still beating but blood flow is impaired. In cardiac arrest, the heart stops beating. For more information, see the first part of this series (C+D, March 9, p16).

Patients who have STEMI or a cardiac arrest are at greatest risk of death in the first few hours after the attack. Around 30 per cent of patients experiencing cardiac arrest die before discharge from hospital, and 7 to 8 per cent of other patients (with STEMI or NSTEMI) die within 30 days of a hospital admission.[2] Patients with NSTEMI tend to be older and have more associated medical and social problems; their length of stay in hospital is longer and their risk of dying is greater.[2]

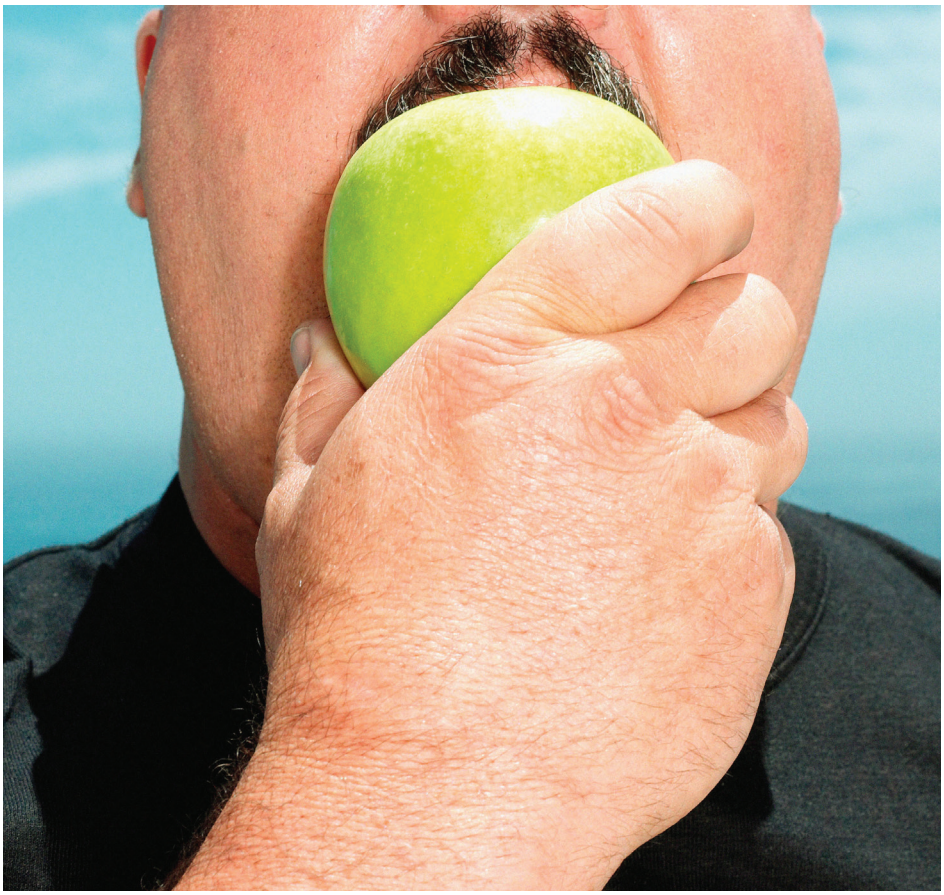
Improved treatments in the acute stages of an MI account for 60 per cent of the decline in mortality from cardiovascular disease in recent years. Secondary prevention interventions, aimed at lifestyle changes and preventative medication, account for 40 per cent of this decline.[3]

These treatments and interventions also reduce the considerable morbidity and disability associated with MI. Pharmacists can support patients by giving advice about lifestyle changes and preventative medications during dispensing or MURs.

Risk factors

There are several factors associated with a high risk of a second myocardial infarction. These include:[4]

- age more than 75 years
- diabetes
- tachycardia at rest (heartbeat greater than 100 beats per minute)
- poor left ventricular function
- unstable angina, rest or nocturnal angina unrelieved by GTN
- sustained ventricular tachycardia, where episodes last longer than 30 seconds
- frequent episodes of ischaemia (shown by using 24-hour monitoring).



Secondary prevention interventions for MI include lifestyle changes, such as encouraging a healthier diet

Patients who have STEMI require urgent reopening of the blocked artery to restore blood flow (reperfusion), using techniques such as primary percutaneous coronary intervention (PPCI). This involves non-surgical widening of the coronary artery, using a balloon catheter to dilate the artery from the inside; often a metallic stent (or tube) is placed in the artery after dilatation to ensure blood flow is maintained. For some NSTEMI patients this procedure may be carried out at a later date.

Patients who have had this procedure may later develop a thrombus around the stent. The highest risk factor for stent thrombosis is premature discontinuation of antiplatelet medication. Other important risk factors include renal failure, diabetes and lesion bifurcation (where the lesion or plaque that caused the initial blockage splits in two).[5]

Lifestyle changes

Treatment changes have shortened the duration of hospital stays following MI, so there is less opportunity for proper patient education prior to discharge. Patients may be unsure about the lifestyle changes they should be making and this need to be addressed at follow-up.

Pharmacists have opportunities to provide healthy living advice to their patients as part of the NMS or DMR, during an MUR or within enhanced cardiovascular services. They can also signpost patients to other local services, eg organisations that provide specialist exercise programmes for patients with cardiac disease.

Healthy eating, based on a Mediterranean-style diet comprising complex carbohydrates, fruit and vegetables, fish and white meats helps prevent obesity and the development of diabetes, which are risk factors for cardiovascular disease (CVD). The Joint British Societies' guidelines (JBS2) on prevention of CVD[5] recommend that total fat intake should be 30 per cent or less of total energy intake, and intake of saturated fat should be 10 per cent or less of total energy intake. It also recommends consuming at least two portions of oily fish each week and five portions of fruit and vegetables per day.

Exercise, when carried out at a sufficient level, reduces mortality from all causes, including cardiovascular mortality. After an MI, patients are recommended initially to take short walks of about 15 to 20 minutes daily and increase this, under medical supervision, to the usual recommendation of 30 minutes of moderate activity on at least five days a week.[6]

All patients who have had an MI should be offered support to stop smoking and should be advised to keep their alcohol intake to within the recommended limits (men, 21 units per week and women, 14 units per week).[6]

Secondary prevention treatment

Nice guidelines[1] recommend that all patients who have had a heart attack should be offered treatment with a combination of ACE inhibitor, aspirin, beta blocker and statin. Use of secondary prevention medication after the acute event improves outcomes for patients and reduces the risk of death, further cardiovascular events and stent-related thrombosis.

ACE inhibitors and ARBs

The place of ACE inhibitors in the treatment of patients with impaired ejection fraction (less than or equal to 40 per cent), or who have experienced heart failure in the early stages of their MI, is well established in reducing mortality following MI, particularly in the first week.[7] However, sometimes doses are not titrated up to the recommended dose following discharge, and community pharmacists have an important role in querying if further dose titration is required. Pharmacists can also advise GPs that ARBs are a safe and effective alternative for patients who experience side effects with ACE inhibitors.

Aspirin and clopidogrel

Aspirin has established benefits in secondary prevention and should be used indefinitely in all patients with STEMI. Low dose (75 to 100mg daily) regimens are associated with fewer gastrointestinal bleeds.[7] Patients who are intolerant of aspirin can be given an ADP (adenosine diphosphate) receptor blocker, such as clopidogrel.

For those intolerant of clopidogrel, a combination of aspirin and warfarin should be considered. However, this does increase the risk of bleeding and should only be used in patients with a low bleed risk.[8]

Dual antiplatelet therapy (DAPT), combining aspirin and an ADP receptor blocker, is recommended for up to 12 months after the insertion of a stent, particularly for those with STEMI. However, one study found that only two-thirds of patients received a primary care prescription for clopidogrel in the first three months after their MI; again, pharmacists may have a role in advising GPs and helping to ensure best-practice prescribing is followed.[9]

A card developed by the UK Clinical Pharmacy Association (UKCPA) and British Heart Foundation has been used to increase patient knowledge about clopidogrel as part of their antiplatelet treatment, the intended duration of therapy and likely side effects. Patients should be advised to carry their card with them at all times.

The use of proton-pump inhibitors (PPIs) with clopidogrel to prevent gastric bleeding is controversial, as omeprazole and esomeprazole reduce its antiplatelet effect, but other PPIs can be used if specifically required.

Beta blockers

The benefits of long-term treatment with beta blockers after STEMI were established largely prior to the development of modern reperfusion therapy and pharmacotherapy, but they remain part of the treatment regimen. Beta blockers are contraindicated in patients with underlying conditions such as COPD or hypotension. Pharmacists should enquire about use and side effects related to beta blockers, such as dizziness or tiredness, during medication reviews.

Statins

Statin therapy is recommended for all adults with clinical evidence of CVD. High-dose statin regimens have been shown to reduce the risk of cardiovascular death, non-fatal myocardial infarction and ischaemic stroke more than regimens using lower doses.[5,10]

Pharmacists should encourage patients who are taking statins to report any side effects, such as muscle pain. Simvastatin is contraindicated for use with ciclosporin, danazol and gemfibrozil, as there is an increased risk of myopathy.[11]

The risk of myopathy is also increased if simvastatin is used with amlodipine or diltiazem, and the MHRA recommends a maximum daily dose of 20mg simvastatin if they are prescribed together.[11] Patients on lower doses can still benefit from some of the cholesterol-reducing effect of simvastatin, but are less likely to suffer side effects.

Other medicines

Eplenerone, which blocks aldosterone, may be prescribed for post-STEMI patients with an ejection fraction less than or equal to 40 per cent. Calcium channel blockers, usually verapamil, are used to prevent re-infarction and death and may be prescribed for patients with contraindications to beta blockers. They are particularly useful for those with COPD and for patients without heart failure.

Management

Pharmacists have an important role in helping patients understand the reasons for continuing to take these complex regimens, and to get the most from medicines prescribed for secondary prevention.

Patient adherence to treatment with antiplatelet medicines remains a particular challenge and there are also concerns about how to encourage the patients at highest risk after MI to continue to take their statins.

Antiplatelet and antithrombotic therapies may be difficult for patients to understand and are likely to become more complex in the future. Written memory aids are often useful, as is the antiplatelet card developed by UKCPA.

Repeat prescription management provides a useful intervention to support some patients and may allow scope for asking patients about their adherence with treatment.

References

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5. Wood D, Wray R, Poulter N, et al, JBS 2: *Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice.* Heart, 91; Suppl 5: 1-52
6. Iakovou I, Schmidt T et al, (2005) *Incidence, predictors and outcome of thrombosis after successful implantation of drug-eluting stents.* JAMA; 293: 2126-36.

5 minute test

■ Sign up to take the 5 Minute Test and get your answers marked online: www.chemistanddruggist.co.uk/update

Take the 5 Minute Test

1. Half of patients experiencing cardiac arrest die before discharge from hospital.
True or false?
2. Secondary prevention interventions after an MI account for 60 per cent of the decline in mortality from CVD in recent years.
True or false?
3. Factors associated with a high risk of re-infarction include angina, diabetes and age older than 75 years.
True or false?
4. The Joint British Societies' guidelines on prevention of CVD recommend that total dietary fat intake should be 40 per cent of total energy intake.
True or false?
5. After an MI patients are initially advised to exercise by taking daily walks of about 15 to 20 minutes.
True or false?
6. Nice recommends all patients who have had an MI should be offered treatment with an ACE inhibitor, aspirin, a beta blocker and a statin.
True or false?
7. Aspirin should be used indefinitely in all patients with STEMI.
True or false?
8. Dual antiplatelet therapy is recommended for up to six months after the insertion of a stent.
True or false?
9. Simvastatin is contraindicated for use with ciclosporin, danazol and gemfibrozil.
True or false?
10. The MHRA recommends a maximum daily dose of 40mg simvastatin if prescribed with amlodipine or diltiazem.
True or false?

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7. ESC/EACTS. *Guidelines on cardiac revascularization.* Europ Heart J. 32:2501-55.
8. British National Formulary No 64, September 2012.
9. Boggon R, van Staa TP et al, (2011) *Clopidogrel discontinuation after acute coronary syndromes: frequency, predictors and associations with death and myocardial infarction – a hospital registry-primary care linked cohort (MINAP-GPRD).* Eur Heart J 32: 2376-2386.
10. *NCCPC Lipid Modification: Cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease.* RCGP, May 2008.
11. *Simvastatin: evidence supporting recent advice on dose limitations with concomitant amlodipine or diltiazem.* MHRA Drug Safety Update, October 2012.

Ask your questions on cardiovascular disease

Do you have a question on MI or any other cardiovascular topic? From therapy choices to risk factors, our specialist is on hand to help. Submit your questions now via **chris.chapman@ubm.com**

Tips for your CPD entry on myocardial infarction

Reflect **What are the risk factors associated with re-infarction after an MI? Which four drugs does Nice recommend for all patients who have had an MI? Who is dual antiplatelet therapy recommended for?**

Plan **This article describes secondary prevention in myocardial infarction (MI) and includes information about risk factors for a second MI, lifestyle changes and secondary prevention treatment regimens. The role of the pharmacist in helping patients to understand and manage their treatments is also discussed.**

Act **Read the article and the suggested reading (below), then take the 5 Minute Test (left). Update subscribers can then access their answers and a pre-filled CPD logsheet.**

Read more about the prevention of cardiovascular disease on the Patient UK website
tinyurl.com/coronary5
Find out more advice you could give to patients about healthy eating and lowering cholesterol from the NHS Choices website
tinyurl.com/coronary6
Read the advice for exercising after a heart attack from the British Cardiac Patients Association
tinyurl.com/coronary7
Read the MUR tips for ACE inhibitors, statins and beta blockers on the C+D website
tinyurl.com/coronary8
Find out the information included on the UK Clinical Pharmacy Association antiplatelet card
tinyurl.com/coronary9

Evaluate **Are you now confident in your knowledge of the risk factors for re-infarction after an MI? Could you give advice to patients who have suffered an MI about lifestyle and preventative treatment?**