Pharmacological interventions to manage coronary heart disease

The white paper, Saving Lives: Our Healthier Nation (Department of Health, 1999), set a target to reduce the death rate from heart disease by 40 per cent for people aged under 75 by 2010. To meet this, the National Service Framework for Coronary Heart Disease (DoH, 2000) set out a plan to ensure agreed standards of care are available to everyone. One focus is to prevent illness through secondary prevention.

Secondary prevention aims to limit the progression of CHD in people with existing disease – for example, people with angina or those who have had a myocardial infarction – by offering advice and treatment.

Uptake of secondary prevention strategies varies across the UK (Iqbal et al, 2001). National audits in primary and secondary care have shown that only a small proportion of those who could benefit are receiving all of the advice and treatment recommended.

Often simple treatments and lifestyle advice are not offered in hospital to patients who have had a myocardial infarction (DoH, 2000). Yet there is potential to reduce the risk of a further cardiovascular event in patients with established coronary artery disease by adjustments to lifestyle and the use of prophylactic drug treatment (Bowker et al, 1996). Nurses are in an ideal position to ensure that patients are receiving appropriate medicines, advice and monitoring.

Drug therapy and secondary prevention The NSF for CHD suggests that patients with clinical evidence of occlusive arterial disease should receive antiplatelet drugs, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors and statins. Research demonstrates a potential reduction in cardiac risk of one in five people with cardiovascular disease.

NICE guidelines The National Institute for Clinical Excellence has issued guidelines on drug treatment for patients after an acute myocardial infarction (NICE, 2001).

All patients should be offered long-term treatment, first with a beta-blocker and antiplatelet drug, after which an ACE inhibitor and a statin should be added (Box 1). It is reasonable to continue treatment with these drugs indefinitely unless there are contraindications or the patient is experiencing side-effects (NICE, 2001).

Beta-blockers, aspirin and ACE inhibitors should be prescribed after an acute myocardial infarction, while the patient is in hospital. If this does not happen, the primary care team should start treatment as soon as possible after discharge.

Often statins are also prescribed in hospital but if this does not happen, patients should be assessed and have treatment started three months after an acute myocardial infarction. There is no evidence showing the long-term benefits of the use of statins initiated within the first three months after an acute myocardial infarction (NICE, 2001).

Antiplatelet drugs Antiplatelet therapy reduces the risk of vascular death by one-sixth, non-fatal myocardial infarction by one-third and non-fatal stroke by one-third, when used for secondary prevention of acute myocardial infarction. The antiplatelet drug aspirin is linked with a 25 per cent overall reduction in acute myocardial infarction, stroke or vascular death (Adabag and Kennedy, 2001). Aspirin is therefore recommended for most people with cardiovascular disease.

The aim is to reduce platelet adhesion and aggregation so preventing thrombus (clot) formation. The initial dose is usually 150–300mg given at the time of myocardial infarction, followed by a maintenance dose of 75mg daily if there are no contraindications.

Clopidogrel is an alternative for patients with an aspirin intolerance or those who have a further cardiovascular event while taking aspirin. There is growing support for its prescription alongside aspirin for certain patients, for example those with acute coronary syndrome without ST-segment elevation (British Medical Association and Royal Pharmaceutical Society of Great Britain, 2003).

Beta-blockers (beta-adrenoceptor blocking drugs) Beta-blockers reduce stimulation of beta-adrenoceptors, leading to a decrease in the force and rate of contraction of the heart. They also reduce peripheral vascular resistance. The effect is to reduce the heart’s workload.

The literature suggests that treatment of patients with...
beta-blockers reduces total mortality, sudden death and reinfarction rates following an acute myocardial infarction. The beneficial effects last as long as the treatment continues. These include a 20 per cent reduction in long-term mortality and a 30 per cent reduction in risk of sudden death (Mehta and Eagle, 1998).

Treatment for patients who also have heart failure needs to be commenced with caution. Beta-blockers should start at a low dose and slowly increase with close monitoring, because side-effects, such as hypotension, may occur.

ACE inhibitors ACE inhibitors inhibit the conversion of angiotensin I to angiotensin II, which is a strong vasoconstrictor. This leads to a reduction in blood pressure and slows the progression of dysfunction in the left ventricle following an acute myocardial infarction. The HOPE study (Heart Outcomes Prevention Evaluation Study Investigators, 2000) suggests that ACE inhibitors have a preventative role in patients at high risk of cardiovascular disease. This study showed that treatment with ramipril led to a reduction in cases of acute myocardial infarction, stroke or death from cardiovascular causes when compared with a placebo.

Patients with heart failure who could benefit from treatment with ACE inhibitors should commence treatment with specialist supervision, because complications such as hypotension may occur.

Renal function should be assessed before treatment and after each significant dose increase, because renal impairment is a possible side-effect. Patients intolerant of beta-blockers and ACE inhibitors may take calcium-channel blockers such as diltiazem, which is usually used to manage symptoms such as angina and hypertension.

Statins Statins reduce cholesterol by inhibiting enzymes that make cholesterol in the liver. Trials on the effect of the statin simvastatin showed a 42 per cent reduction in deaths due to coronary heart disease (Scandinavian Simvastatin Survival Group, 1994). Similar results were shown with pravastatin (Stenestand and Wallentin, 2001).

Evidence from the Heart Protection Study Collaborative Group (2002) shows that use of statins reduces the risk of myocardial infarction by one-third, even in people with normal cholesterol. There is a case for monitoring and treating more people with statins but this has cost implications and there are problems with long-term side-effects. Also, NICE (2001) states that the evidence for treating lower cholesterol levels is unclear.

Patients who are being considered for treatment with a statin should have their serum cholesterol measured to determine if treatment is necessary. This test will also provide a baseline before treatment is started and identify patients who have familial lipid disorders, which may not respond to treatment with statins.

The benefits of statins should be monitored by annual blood tests (NICE, 2001). The target for treatment with statins is to achieve a serum cholesterol of less than 5 millimole per litre (mmol/l) and low-density lipoprotein (LDL) of less than 2mmol/l or a reduction in LDL of 30 per cent, whichever is larger (DoH, 2000).

Liver function tests should be carried out before treatment and at six months and one year after treatment (BMA and RPSGB, 2003), or according to local policy, to detect signs of liver damage, a possible side-effect.

Lifestyle interventions Improvement in cardiovascular function is best achieved in patients following an acute myocardial infarction via a combination of drug and lifestyle therapy. Lifestyle interventions include:

- Smoking cessation – the risk of developing heart disease is halved after one year in smokers who stop;
- Physical activity – this is strongly associated with a reduction in risk of coronary heart disease;
- Dietary modification – less saturated fat and an increase in oily fish and monounsaturated fatty acids;
- Reduced salt intake – a lower salt intake can lead to a fall in blood pressure, so reducing the risk of CHD.

Conclusion Many clinical teams look after patients after an acute myocardial infarction. The NSF for CHD recommends a written, local, hospital-wide protocol to guide treatment (Box 2). There is growing evidence of improved survival and quality of life after an acute MI when patients receive appropriate drugs. Nurses need to know what is recommended and ensure its delivery.

**Box 2. Optimal Drug Therapy After an Acute Myocardial Infarction**

- Patients should be prescribed aspirin and receive a supply on discharge from hospital.
- Clopidogrel is an alternative to aspirin if indicated.
- Beta-blockers should be started as soon as possible following an acute MI. Patients with heart failure may benefit from beta-blockers but require close monitoring.
- After an acute MI, patients should receive an ACE inhibitor. This should only be withheld if the patient has contraindications such as hypotension, bilateral renal artery stenosis, or a history of allergy or intolerance to ACE inhibitors. Patients with heart failure require close supervision when ACE inhibitors are introduced.
- If indicated by cholesterol levels, start treatment with a statin and make dietary and lifestyle modifications.

Source: Adabag and Kennedy (2001)