By reading this article and writing a practice profile, you can gain ten continuing education points (CEPs). You have up to a year to send in your practice profile. Guidelines on how to write and submit a profile are featured at the end of this article.

Myocardial infarction and older people

This article aims to examine acute coronary syndromes in older people. It will focus specifically on acute myocardial infarction, its causes and how it presents in the older person. Evidence-based management will be outlined and the importance of secondary prevention and rehabilitation for older people will be discussed.

After reading this article you should be able to:
- define what is meant by acute coronary syndromes, in particular myocardial infarction
- outline the main risk factors for myocardial infarction and the presenting symptoms in older people
- outline contemporary management for patients who have had a myocardial infarction
- discuss the role of the nurse in relation to recognising the symptoms of myocardial infarction, secondary prevention and rehabilitation in older people.

Introduction

Coronary heart disease (CHD) is one of the biggest killers in the United Kingdom; in England alone over 300,000 people have a myocardial infarction (MI) each year (Department of Health 2000). Almost half of all myocardial infarctions occur in people aged over 70 and it is recognised that older patients have a much poorer outlook following an MI than younger people. It is estimated that 80 per cent of all deaths due to MI occur in those aged over 75 (Vickers et al 2003). The explanations for such a high mortality rate may, in part, be explained by the increasing severity of the disease process in older people, but inequalities in access to appropriate treatments and atypical presentation of symptoms in older people may also contribute to this. In an attempt to overcome inequalities in health care the government has introduced a series of national service frameworks (NSFs) (DoH 2000, 2001). The aim of these is to ensure equal access to services and predictable and equal standards of care for all people regardless of age, socio-economic status or geographical region.

In what areas of your practice has the NSF for older people had an impact? Give two examples.

Your answers to Time Out 1 will probably depend on the area in which you work, but you may have identified strategies designed to reduce the number of falls in the older population. Nurses working in accident and emergency may have identified areas where older people do not get referred to specialist services as promptly as younger people.

One issue that has been identified as an area for

In brief

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Summary
Nurses have a central role to play in the care of older people who have suffered a myocardial infarction. This article points out that such patients may not present with typical symptoms so it is important to be aware of signs that indicate problems. It suggests that following diagnosis it is vital that older people are offered evidence-based treatment and that secondary prevention and rehabilitation are considered.

Keywords
- Elderly health
- Heart disorders: prevention and screening, nursing, rehabilitation

These key words are based on subject headings from the British Nursing Index. This article has been subject to double-blind review.
Heart disorders

Concern in differential diagnosis and access to timely and relevant treatment has been that of CHD in the older population (Then et al 2001). Targets set in the NSF for older people (DoH 2001) are aimed at reducing age discrimination in relation to access to specialist services. Additionally the NSF for CHD (DoH 2000) sets out 12 standards for reducing the burden of CHD within the population. The targets aim to identify those most at risk of CHD and help them to reduce those risks, offering timely and appropriate interventions for those suffering acute cardiac symptoms and providing comprehensive rehabilitation programmes following such interventions. The targets in this NSF cover all age groups and as CHD is prevalent in older people it is imperative that nurses and other healthcare professionals caring for this age group have a clear understanding of the causes, identification and management of CHD.

Now do Time Out 2

Time Out 2
Reflect on patients you have nursed who had cardiac problems. What types of problems did they have?

You may well have noted that patients you have cared for suffered with breathlessness or chest discomfort on exertion. These may be caused by problems with their heart valves such as mitral regurgitation or aortic stenosis, but are more commonly the presenting symptoms of CHD. Other symptoms that sometimes occur in the older person will be discussed in the next sections. In this section the focus is on the pathophysiology of CHD.

Pathophysiology of CHD

The myocardium (heart muscle) is supplied with blood by the coronary arteries. These arise at the base of the ascending aorta and run along grooves on the surface of the heart. Thus, the first organ to be provided with oxygen-rich blood with every heart beat is the heart itself. This ensures that the heart has all the nutrients it requires to maintain its repeated pumping action, which delivers oxygenated blood to all the body’s organs. There are three main coronary arteries that supply the myocardium: the left coronary artery divides into the left circumflex artery and the left anterior descending artery. These supply most of the front, side and back of the left side of the heart. The right coronary artery supplies the right side and part of the bottom of the heart. These arteries all branch off into smaller vessels. This results in a fine network of arteries supplying the entire myocardium with the oxygen and nutrients it requires. Any disruption to this supply can cause significant problems.

The primary problem in CHD is an imbalance between the supply of oxygen to the myocardium and the demands made upon it. CHD affects the coronary arteries and is caused by a process called atherosclerosis (Hand 2001). In this process excess lipids (fats) that are circulating in the blood infiltrate the coronary artery walls, resulting in atheromatous plaques building up and eventually bulging out into the arteries. This reduces the lumen of the arteries and this narrowing diminishes the amount of blood that can be supplied to the myocardium. This process takes many years and may affect more than one artery. The heart, however, can sense any deficiency in blood supply to the myocardium and can send signals to other nearby arteries to take over the blood supply of the affected part of muscle. This is called ‘collateral circulation’. Any reduction in blood supply to the heart muscle (myocardial ischaemia) may cause the patient to complain of chest pain or discomfort. This is called angina and it may be associated with shortness of breath due to transient heart failure. This is a temporary inability to pump blood to the lungs, with a resultant reduction of gas exchange.

The atheromatous plaques are very fragile and rupture easily. When this happens it triggers the body’s clotting mechanisms and a thrombus (clot) at the rupture site can cause complete occlusion of the coronary artery. This results in an area of myocardium being totally deprived of oxygen and is called a myocardial infarction or heart attack. As the blockage of the artery is sudden, there is no time for the body to develop a collateral blood supply. In this scenario, part of the heart muscle dies (necroses) due to the total loss of blood supply. This is a potentially fatal situation. The severity of the condition depends upon the area and size of heart muscle affected.

Recently, very sensitive blood tests have been devised that are able to detect the extent of the myocardial damage that has occurred. These tests, together with signs of damage that show up on a 12-lead ECG, help the specialist cardiac team to diagnose the exact extent of the problem. The umbrella term ‘acute coronary syndromes’ has been adopted to cover a spectrum of acute conditions that result from the process described above. Acute coronary syndromes extend from acute myocardial infarction through to minimal myocardial injury to unstable angina (Fox 2000). For the purposes of this article, we will focus on acute myocardial infarction.

Now do Time Out 3

Time Out 3
Consider the patients you noted in Time Out 2. What risk factors for coronary heart disease did they have?

Risk factors for CHD

There are well-known risk factors for coronary heart disease. Modifiable risk factors are those that can be modified by behaviour changes or treatment, and non-modifiable risk factors are those that cannot be changed (Table 1).

Table 1: Risk factors for CHD

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Older patients generally have a risk factor profile somewhat different from that of their younger counterparts (Chen et al. 1999, Simons et al. 2002). For instance, there are greater numbers of women who have heart disease in the older population. This is largely due to changing hormone levels following the menopause as the cardio-protective influence of oestrogen is reduced in post-menopausal women. Additionally, older patients with CHD are less likely to have elevated cholesterol levels or a family history of heart disease. Older people are, however, more likely to have a history of hypertension and diabetes mellitus and may have co-existing health problems that limit their ability to exercise, thus increasing the risk of obesity.

Assessment

It has been suggested that not only do older people with CHD have a different risk-factor profile than their younger counterparts, but that they may also present with different symptoms (Then et al. 2001). For example, acute chest pain is often absent in myocardial infarction in older people.

Older patients are more likely to complain of breathlessness, weakness, generalised aches, indigestion or back pain which may not alert the healthcare professional to suspect that they are suffering from an acute coronary event (Dunbar 1996, Fletcher and Forch 1999). These symptoms may well be explained away, by both the older person and the healthcare worker, as signs of a viral infection or an inevitable sign of ageing. Additionally, in some older people an MI may precipitate an acute confusional state. Any patients who become acutely confused should not only be investigated for potential infections as a causative factor, but also their cardiac risk factors and an ECG may indicate that they have suffered an MI.

Chest pain can also be masked in those patients with diabetes. Shoulder and neck pain may also be presenting symptoms (White Robinson and Sloan 2000) but this may be missed in patients with arthritis. It is therefore crucial to take a detailed history of changes in symptoms.

Fletcher and Forch (1999) suggest that the nurse should always consider worst-case scenarios rather than dismissing vague signs and symptoms in older people. It is suggested that the assessment should include any non-specific symptoms such as decrease in involvement in daily activities and changes in functional and cognitive status, as well as a full medical history including medications.

Medical management

In the management of an acute MI thrombolytic agents are used to dissolve the clot within the artery and therefore limit the amount of damage to the myocardium. The sooner they are given, the more beneficial their effect and the greater the reduction in mortality and morbidity. It is recommended that all patients receive thrombolysis, but studies have shown that older people are not always as likely to receive thrombolysis as younger patients and are not often included in research studies (Chen et al. 1999, Vickers et al. 2003).

The contraindications for thrombolysis are shown in Table 2. Patients over the age of 65 are much more likely to have contraindications (Vickers et al. 2003), which is one of the reasons why they may not be given thrombolysis. Another reason is attributed to the fact that their symptoms are not correctly interpreted until it is too late for thrombolysis to have a beneficial effect (Then et al. 2001, Vickers et al. 2003). Although research indicates that older patients have larger infarcts, higher mortality post MI and longer hospital stays, there is evidence to suggest that mortality is decreased with the use of thrombolysis with this age group (Rich 1999).

There are a number of different thrombolytic agents that can be used; the most common are streptokinase and teneceplase. These drugs are normally given in the accident and emergency department or coronary care unit (CCU) where the patient can be closely monitored for any side-effects.

Aspirin is usually given at the time of the MI and should be continued daily afterwards. This drug acts as an antiplatelet and can reduce the chance of further clot formation in the future. Although the dose recommended is fairly small it can still cause gastric irritation in some patients. It would seem that older people are less likely to be prescribed aspirin, despite evidence of its benefits (Vickers et al. 2003). This again may be attributed to the potential side-effects. Clopidogrel can be used as an alternative.

The other drug of choice post MI is a beta-blocker. It is usual practice to use one that is cardio selective such as metopolol or atenolol to minimise side-effects such as hypotension. It is suggested that the initial dose given to older people should be as low as possible to achieve the desired effect, but without causing problems.

<table>
<thead>
<tr>
<th>Table 2 Contraindications to thrombolysis</th>
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<tbody>
<tr>
<td>Confirmed aortic dissection</td>
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<tr>
<td>Active peptic ulcer</td>
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<tr>
<td>CVA within 12 months</td>
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<tr>
<td>Warfarin with INR (international normalised ratio) &gt; 2</td>
</tr>
<tr>
<td>Severe hypertension – above 180/110</td>
</tr>
<tr>
<td>Other poor prognosis</td>
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<tr>
<td>Recent major surgery</td>
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</table>
with interactions with other possible medications. Chorzempa and Tabloski (2001) suggest that patients over the age of 80 are the most likely to benefit from beta-blockers but are the least likely to receive them. Mortality following an MI is decreased by 23 per cent in older patients receiving beta-blockers (Rich 1999).

ACE inhibitors help to decrease the incidence of heart failure post MI. They can also be used in the treatment of hypertension. The use of ACE inhibitors has been shown to improve survival in older patients, but small doses may need to be given to avoid toxicity (Chorzempa and Tabloski 2001). The patient’s blood pressure needs to be monitored carefully when they are first commenced on ACE inhibitors as they can cause hypotension.

Calcium channel blockers such as diltiazem and nifedipine are sometimes used in those patients who cannot receive beta-blockers. However, they are not recommended as first line treatment in post MI management.

After an MI, most patients are nursed in a CCU and kept on bed rest for 24 hours. During this time the patient is monitored continuously, with oxygen therapy for the first few hours. Diamorphine IV with an anti-emetic can be given to control the initial presentation of pain, if applicable, and then any subsequent pain that is not controlled by glycerol trinitrate (GTN). A pain measurement tool can be useful, as well as looking for non-verbal signs of pain in the patient.

If the patient continues to experience chest pain, then they may be commenced on a GTN infusion. This needs to be carefully titrated against the patient’s pain and blood pressure as it can cause hypotension and respiratory depression, particularly in older people who may be more sensitive to the actions of analgesia (Leininger 2002). Patients need to be informed that it may cause a headache, and analgesia such as paracetamol can be given if required.

Once the patient is pain-free a graded activity programme will be introduced. This will normally involve the patient participating in his or her own care needs, but interspersed with rest. As long as the patient is pain-free and has no heart rhythm abnormalities they may be moved out of the CCU after 48 to 72 hours. This can sometimes be quite daunting for patients as they may no longer feel that there is such a close eye being kept on them. It is especially important that nurses caring for older people who have had an MI are aware of how vulnerable they may be feeling at this point. However, it should be emphasised that being moved from the CCU indicates that the patient’s condition is improving.

Although the average length of stay post MI can be between five and seven days, this has been shown to be longer for older people (Chen et al 1999). This may be due to complications associated with the MI such as left ventricular failure, heart rhythm abnormalities or other medical problems that have been exacerbated. It is suggested that all patients have someone staying with them for at least one to two weeks following an MI, as social isolation can alter the patient’s mood and delay recovery (Fleury and Keller 2000). This factor should be considered when planning the discharge of older people who have had an MI.

**Primary prevention**

Earlier, the risk factors for CHD were identified. It is a common misconception that the modification of these is not useful in an older person. However, studies show that cessation of smoking and reduction in cholesterol is beneficial in reducing further cardiac events and decreasing mortality regardless of the patient’s age (Vickers et al 2003). Yet a study by Chen et al (1999) found that only about 30 per cent of suitable patients aged over 75 received lipid-lowering therapy.

Patient education needs to be addressed sensitively after myocardial infarction. There is a lot of information required by patients and their families, so it is important not to bombard them. It may be useful to involve other professionals where appropriate, including cardiac rehabilitation nurses and dieticians, and refer patients to their practice nurse. Evidence demonstrates that the best time to address secondary prevention issues is in the first few weeks post MI (Squires et al 1990). This is often when the patient is feeling isolated and may be depressed, but may be looking for ways to improve their health. Unfortunately, for most patients this is the least likely time that they will come into contact with a health professional who can give them guidance. Some areas offer telephone support or home visits to try and address this problem.

According to Prochaska and Diclemente (1984), most people will go through stages with regard to behaviour change (Table 3). As health professionals, if we can identify a per-

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### Table 3: Stages of change model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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<tbody>
<tr>
<td>Pre-contemplation</td>
<td>the patient will not have considered changing their lifestyle and may not be aware of the risks associated with their behaviour.</td>
</tr>
<tr>
<td>Contemplation</td>
<td>the patient may be aware of the benefits of behaviour change but is still not ready to do this. The nurse can assist by helping the patient weigh up the pros and cons to changing behaviour.</td>
</tr>
<tr>
<td>Ready for action</td>
<td>the patient has decided to change behaviour but may need some support or advice in order to achieve this.</td>
</tr>
<tr>
<td>Action/maintenance</td>
<td>the behaviour change has been achieved, but ongoing support may be required.</td>
</tr>
<tr>
<td>Relapse</td>
<td>this may happen occasionally. The patient may go back to the beginning of the cycle or may go back to the action phase.</td>
</tr>
</tbody>
</table>
REFERENCES

CONTINUING PROFESSIONAL DEVELOPMENT
Heart disorders

Cardiac rehabilitation

Cardiac rehabilitation aims to restore patients to their former status. It has been divided into four phases, which include the following components:

- **phase one**: from cardiac event to discharge. This phase includes education, psychosocial assessment, reassurance and activity guidance and usually involves those people who are looking after the patient
- **phase two**: immediately post discharge to four to six weeks post event. This can include telephone support, outpatient or home visits. This phase includes secondary prevention, reassurance and activity guidance
- **phase three**: four to 12 weeks post MI. This is the phase that most people associate with cardiac rehabilitation and involves an exercise programme. This is usually held at a hospital but can also be provided at a local leisure centre. Patients are given an opportunity to exercise under supervision. Programmes also include education and relaxation. There are also programmes that patients can do at home
- **phase four**: long-term follow up and evaluation. This phase may include membership of a support group.

Unfortunately it would seem that older people are not always included in cardiac rehabilitation. This is partly because they may not have been referred in the first place, but also because they may have other pre-existing conditions such as arthritis that limit their ability to exercise. They are often not included in research studies looking at the efficacy of cardiac rehabilitation, so it is not proven what the benefits for the older age group may be. However, it has been suggested that it can have beneficial effects on activity and wellbeing (Chen et al 1999, Kennedy Thow 2002).

Exercise programmes may have to be adapted to suit those who are chair-bound and in some cases it is more appropriate to suggest an increase in daily activities as opposed to a structured activity programme. For any patient it is important that where possible the programme is tailored to the individual and is evaluated in terms of the patient’s symptoms and physical abilities (Forman and Farquhar 2000, Kennedy Thow 2002).

Summary

Older people who have had an MI may not present with typical symptoms. Thus it is important that nurses caring for older people are aware of the symptoms that may indicate an infarct. Once a diagnosis has been made it is imperative that older people are offered evidence-based treatment strategies and that secondary prevention and rehabilitation are not overlooked.

Now do Time Out 8

**TIME OUT 7**

Think about which members of the multidisciplinary team need to be involved in the rehabilitation of older people following a myocardial infarction. Do you know which cardiac rehabilitation services are provided in your area?

**Cardiac rehabilitation**

- **phase one**: from cardiac event to discharge. This phase includes education, psychosocial assessment, reassurance and activity guidance and usually involves those people who are looking after the patient
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**TIME OUT 8**

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