4 Risk factors and drug treatment for coronary heart disease

4.1 Introduction

The reduction in the occurrence of heart attacks in Australia (shown in the previous chapter) may be due to reduced overall levels of CHD risk factors in the population and/or improved medical care for those at higher risk of heart attack. Reducing the levels of biomedical and behavioural risk factors, and improving the use of effective drug treatments has the potential to lead to large reductions in coronary event rates (McElduff et al. 2001).

This chapter explores these issues in detail by examining the major established risk factors for CHD, and drug treatment for people with higher risk factors and established CHD.

4.2 Risk factors for coronary heart disease

Given that CHD remains highly fatal despite major gains in treatment, prevention still offers the greatest scope for reducing mortality. The previous chapter highlighted that increasing age and being male are risk factors for CHD. Although these risk factors cannot be modified, there are biomedical and lifestyle and behavioural factors for CHD that can be modified—high blood cholesterol, high blood pressure, overweight and obesity, tobacco smoking, insufficient physical activity and dietary factors. Diabetes is also associated with a high risk of CHD as it shares several of the risk factors with, and is itself a risk factor for, CHD. Although beyond the scope of this project, risk factors themselves are influenced by other factors such as people's economic resources, education, living and working conditions, social support, and access to healthcare and social services, as well as by psycho-social factors. This section briefly examines patterns and trends in the major modifiable risk factors for CHD (for further details see AIHW 2001 and AIHW 2002a).

High blood cholesterol

In 1999–00, it was estimated that over six million Australians aged 25 years and over (around 50% of the population) had total blood cholesterol levels higher than 5.5 mmol/L; however, this is an arbitrary value and CHD risk actually increases continuously from very low cholesterol levels. Rates were similar among men and women. The prevalence of high blood cholesterol increases with age, to age 74 in women and 64 in men. Men aged 45–64 years and women aged 55–74 years were twice as likely to have high blood cholesterol levels as those aged 25–34 years. The age gradient is steeper for women than for men (Table 4.1). There has been no marked reduction in the prevalence of high blood cholesterol since 1980, when the first nationwide survey was run (Table 4.2).

High blood pressure

In 1999–00, 29% or 3.6 million Australians aged 25 years and over had high blood pressure (≥ 140/90 mm Hg) or were on medication for that condition. There was no significant difference in the proportion of men and women aged 25 years and over with high blood pressure (31% of men and 26% of women). The prevalence of high blood pressure increases with age, from less than 8% among 25–34 year-olds to over 70% among those aged 65 years and over. The age gradient is steeper for women than for men (Table 4.1). There have been significant declines in the proportion of people with high blood pressure and/or receiving treatment since the 1980s, with rates halving over this period among urban adults aged 25–64 years (Table 4.2). Average blood pressure levels have also declined over this period. At a population level, this decline has occurred among those not on medication for high blood pressure as well as among those on treatment. The reason for these findings is not certain but they are consistent with the greater availability of low-salt products in the food supply (AIHW 2002a).

Table 4.1: Risk factor prevalence rates by age and sex, 1999–2001

	18–24	25–34	35–44	45–54	55–64	65–74	75+	25+ [a]
					Per cent			
Men								
Tobacco smoking[b]	24.5	29.0	26.7	22.0	15.2	11.0	4.8	21.4 [c]
Insufficient physical activity[d]	18.1	46.7	44.5	47.6	50.1	45.8	—	42.0 [e]
High blood pressure[f]	—	7.9	16.2	30.5	46.5	69.7	75.1	30.7
High blood cholesterol[g]	—	31.0	54.2	60.7	61.8	54.1	49.2	49.9
Overweight or obese[h]	—	60.2	65.5	72.5	74.0	73.7	64.3	67.3
Obesity[i]	—	16.7	18.7	20.9	26.3	20.2	11.7	19.2
Women								
Tobacco smoking[b]	23.7	23.8	23.8	17.5	13.5	6.6	4.4	18.3 [c]
Insufficient physical activity[d]	32.4	40.1	46.3	52.0	46.9	46.1	—	43.5 [e]
High blood pressure[f]	—	4.1	7.9	22.8	42.3	66.7	77.2	25.6
High blood cholesterol[g]	—	30.1	39.8	54.7	71.6	74.0	65.2	49.7
Overweight or obese[h]	—	35.8	45.6	58.1	67.2	70.7	56.4	51.7
Obesity[i]	—	11.9	20.9	26.1	31.6	31.0	17.2	21.8

(a) Age-standardised to the 1991 Australian population aged 25 years and over.

(b) The daily smoking of tobacco products, including packet cigarettes, roll-your-own cigarettes, pipes and cigars. Data are for 2001.

(c) Data for ages 18 years and over.

(d) Insufficient physical activity is defined as less than 150 minutes of physical activity for recreation or exercise (including walking for transport) in the previous week.

(e) Data for ages 18–75 years.

(f) High blood pressure is defined as ≥ 140/90 mm Hg or receiving medication for high blood pressure.

(g) High blood cholesterol is defined as ≥ 5.5 mmol/L.

(h) Overweight or obese is defined as body mass index (BMI) ≥ 25.

(i) Obesity is defined as body mass index (BMI) ≥ 30.

Sources: AIHW analysis of the 1999–2000 AusDiab; 2001 National Drug Strategy Household Survey; 2000 National Physical Activity Survey.

Table 4.2: Risk factor prevalence rates among urban adults aged 25–64 years, 1980 to 1999–00

	1980	1983	1989	1995	1999–00
			Per cent		
Men					
High blood pressure	45.3	34.8	33.1	26.3	22.3
High blood cholesterol	49.5	51.6	50.9	n.a.	47.4
Overweight or obese	47.5	48.2	52.5	66.3	64.4
Obesity	9.1	8.5	9.9	19.8	19.2
Women					
High blood pressure	29.4	23.0	21.0	16.0	15.6
High blood cholesterol	40.9	48.1	42.8	n.a	43.8
Overweight or obese	26.1	31.0	35.5	45.9	44.0
Obesity	7.6	10.0	11.8	19.2	21.8

n.a. = not available.

Notes

1. Rates have been age-standardised to the 1991 Australian population aged 25–64 years.
2. High blood pressure is defined as ≥ 140/90 mm Hg or receiving medication for high blood pressure.
3. High blood cholesterol is defined as ≥ 5.5 mmol/L.
4. Overweight or obese is defined as body mass index (BMI) ≥ 25.
5. Obese is defined as body mass index (BMI) ≥ 30.

Sources: AIHW analysis of the 1980, 1983, 1989 Risk Factor Prevalence Studies; 1995 National Nutrition Survey; 1999–2000 AusDiab.

Overweight and obesity

In 1999–00, an estimated 7.5 million Australians aged 25 years and over were overweight or obese (60%), and of these over 2.6 million (21% of the population aged 25 years and over) were obese.[2] Men aged 25 years and over were more likely to be overweight or obese than women of the same age (67% compared with 52%). The proportion of overweight or obese people increased with age and peaked at 55–74 years for men (74%) and 65–74 years for women (71%) (Table 4.1). The age gradient for women is steeper than for men. The prevalence of overweight and obesity has increased significantly over the last two decades by 36% among men and 69% among women aged 25–64 years living in urban areas (Table 4.2). The increase has been even greater among obese Australians, with prevalence rates more than doubling over this 20-year period.

Tobacco smoking

In 2001, one in five Australians aged 14 years and over smoked regularly (3.1 million adults). Men aged 18 years and over were more likely to smoke regularly than women of the same age (21% and 18% respectively). Regular smoking declines with age, with the highest rates occurring among 25–34 year-olds (29% for men and 24% for women) and rates falling to less than 5% for those aged 75 years and over (Table 4.1). Smoking rates have been declining

2. The body mass index (BMI) is the measure used to estimate the prevalence of overweight or obesity in the population and is calculated by weight (kg) divided by height squared (m^2). A BMI of 25 or greater indicates overweight, and 30 or greater indicates obesity.

since the 1950s, when it was estimated that around 70% of men and 30% of women smoked. Since 1985, smoking rates have continued to decline and in 2001 they fell below 20% for the first time (AIHW 2002a).

Insufficient physical activity

In 2000, around 5.7 million Australians aged 18–75 years (42% of men and 44% of women) had insufficient levels of physical activity, meaning that they were not active enough to achieve health benefits (Table 4.1). Rates of physical inactivity were highest among 45–64 year-olds (around 50%) and lowest among 18–24 year-olds (18% for men and 32% for women) (Table 4.1). More than 15% of people reported no leisure-time physical activity at all during the previous week and around 28% did some activity, but not enough to achieve a sufficient level to obtain health benefits (AIHW 2002a). During the 1980s and much of the 1990s there was little change in physical activity patterns. However, between 1997 and 2000, rates of physical inactivity among Australians increased significantly from 38% in 1997 to around 43% in 1999 and 2000 (Bauman et al. 2001).

Diabetes

In 1999–00, an estimated 938,700 Australians aged 25 years and over had diabetes (7.5% of the population). About half of these people were not aware that they had diabetes. An additional 11% had evidence of impaired glucose tolerance (a metabolic stage between normal glucose tolerance and diabetes). In 1999–00 there were 336,976 hospitalisations for diabetes (almost 6% of all hospitalisations) and diabetes accounted for 10,130 deaths in 2000. Males were more likely to be hospitalised and die from diabetes than women. Diabetes prevalence, morbidity and mortality increases markedly with age. There are no national data on trends in the prevalence of diabetes in Australia based on measurements. However, results from the 1981 Busselton Population Survey and the 1999–2000 AusDiab study suggests that the prevalence rate of diabetes in Australia may have doubled over the 20-year period (AIHW 2002b).

Higher risk factor levels among certain Australians

Socioeconomic and cultural factors largely influence the health of individuals and populations, and while these factors are beyond the scope of this project they deserve a brief mention. Aboriginal and Torres Strait Islander Australians and people who are at a socioeconomic disadvantage have much poorer risk factor profiles than other Australians. Aboriginal and Torres Strait Islander peoples are far more likely to smoke tobacco, be physically inactive, be obese, have high blood pressure (in the Kimberley region) and have Type 2 diabetes than other Australians (AIHW 2001). People from lower socioeconomic backgrounds are also more likely to smoke tobacco, be physical inactive, be overweight or obese (women only), and have Type 2 diabetes compared with those from higher socioeconomic groups (AIHW 2002a). Multiple risk factors are also often associated with lower socioeconomic status.

Multiple risk factors

In 1995, over 10 million Australians aged 18 years and over, or 81% of the adult population, had at least one major modifiable risk factor (i.e. tobacco smoking, high blood pressure, overweight and obesity, or physical inactivity). Around 43% of adults had two or more of

these risk factors and 13% had three or more (Table 4.3). The risk of CHD rises progressively with the number of risk factors present.

Table 4.3: Age-specific rates by number of risk factors present, 1995

	Men			Women		
Age group (years)	1+	2+	3+	1+	2+	3+
			Per cent			
18–24	71.5	30.4	5.5	63.4	21.7	3.1
25–34	81.3	39.5	12.2	67.8	24.5	4.8
35–44	85.6	47.6	15.4	72.0	30.0	7.3
45–54	90.9	53.9	19.5	78.8	41.0	11.8
55–64	92.7	65.9	23.4	86.9	53.1	14.6
65–74	92.9	65.5	18.7	88.5	59.1	20.8
75 and over	93.0	65.5	21.7	92.7	65.5	29.3
18 and over	**85.3**	**49.0**	**15.5**	**75.9**	**37.7**	**10.7**

Note: Risk factors include tobacco smoking, high blood pressure (140/90 mm Hg), overweight (BMI ≥ 25) and physical inactivity.

Source: AIHW analysis of the ABS 1995 National Nutrition Survey.

Men were generally more likely to have multiple risk factors than women, with this gender gap becoming steeper as the number of risk factors increase. For example, around half of men aged 18 years and over had two or more risk factors compared with 38% for women. The higher prevalence of multiple risk factors among men was observed across most age groups, except among those aged 65 years and over where women were more likely to have three or more risk factors than men (Table 4.3).

Multiple risk factors are far more prevalent among older Australians than younger Australians. For example, nearly two-thirds of people aged 75 years and over have at least two risk factors compared with 30% of men and 22% of women aged 18–24 years (Table 4.3).

Multiple risk factors are also linked with a condition known as the metabolic syndrome, which has not been addressed in this report. The metabolic syndrome is a clustering of inter-related risk factors including high cholesterol, high blood pressure and central obesity, with insulin resistance thought to be the underlying defect in this syndrome (AIHW 2002a).

Risk factors in people with heart disease

Analysis from the 1995 National Health Survey indicates that Australians reporting heart disease were more likely to have one or more risk factors than those without heart disease (88% compared with 68% respectively) (Table 4.4).

However, when examining each of these risk factors specifically it is interesting to note that people reporting heart disease were less likely to smoke than those without heart disease (12% compared with 18%). On the other hand, being overweight or obese and having high blood pressure was far more prevalent among those with heart disease than those without (overweight: 47% compared with 30%; high blood pressure: 48% compared with 10%). Australians with heart disease were also more likely to be physically inactive than those without heart disease (58% compared with 52%) (Table 4.4).

Table 4.4: Proportion of Australians with a risk factor by condition, 1995

	Heart disease	No heart disease
	Per cent	
Smoking	11.9	17.8
Overweight	47.2	29.9
High blood pressure	48.3	9.6
Physically inactive	58.3	51.8
Total with a risk factor	**88.0**	**68.4**

Note: Overweight and high blood pressure is based on self-reported data.

Source: AIHW analysis of the ABS 1995 National Health Survey.

4.3 Drug treatment

While the substantial decline in CHD mortality and incidence can be partly attributed to declines in some of the major modifiable risk factors, other factors such as medication use also have an effect. Recent evidence from randomised controlled trials has shown that reducing cholesterol or reducing blood pressure will cause a reduction in coronary events (McElduff et al. 2001). There is a wide range of effective drugs to reduce the occurrence of atherosclerosis and high blood pressure—important factors in the prevention and treatment of people with CHD—and these will be discussed in this section. The data refer mainly to the use of prescription drugs in the community, although the use of aspirin and thrombolytics will also be briefly discussed.

The drugs presented in this section are prescribed not only for the purpose of lowering the levels of blood pressure and blood cholesterol but also for other purposes such as inhibiting and dissolving blood clots, and reducing the immediate and long-term damage done to the heart. As the indication for which the drug is prescribed is not recorded, it is not possible to determine the actual use of the drug for specific conditions or purposes.

Drug use in this report is expressed in terms of defined daily doses per 1,000 population per day (DDD/1,000/day). For further details see Chapter 2.

Blood pressure lowering drugs

Although drugs in this class are grouped as 'blood pressure lowering', in general they have other important and useful effects, and are used to treat various conditions as well as high blood pressure.

ACE inhibitors

Angiotensin-converting enzyme (ACE) inhibitors are commonly prescribed to treat people with high blood pressure or heart failure. These drugs limit the progressive enlargement of the heart after a heart attack and relieve heart failure symptoms. If given early during a heart attack, they can reduce deaths (AIHW 2001). In 1998, ACE inhibitors were one of the most widely dispensed drugs for cardiovascular disease (66.2 DDD/1,000/day). Between 1990 and 1998, there was a threefold increase in the consumption of this drug, with the greatest increase occurring in the early 1990s (twofold increase between 1991 and 1994). Since then

the consumption of ACE inhibitors has increased steadily by around 27% (between 1995 and 1998) (Table 4.5).

In 1998, enalapril was the most widely used ACE inhibitor (19.1 DDD/1,000/day) (AIHW 2001).

Results from the MONICA study in Perth and Newcastle (see Chapter 2 for details) show that less than 19% of people aged 35–64 years were treated with ACE inhibitors before the coronary event, with this proportion increasing to around 32–37% during the admission for a coronary event in 1991–93 (Table 4.6). Treatment with ACE inhibitors after discharge was also estimated to be around 30–35% (AIHW: McElduff et al. 2000). Between 1985–87 and 1991–93 the use of ACE inhibitors increased markedly before and during the coronary event admission, with a more rapid growth in the use of this drug observed during the admission (Table 4.6).

Beta blockers

Beta blockers are used to treat people with high blood pressure. They can also reduce pain and death in people with angina and a history of heart attacks, and prevent further heart attacks and stroke by lowering blood pressure. Between 1990 and 1998, the use of beta blockers was highest in 1990 but fell progressively to 1994 and has remained steady since then (Table 4.5). In a recent OECD study with 11 other countries, Australia was the only country where the prescription of beta blockers decreased (OECD 2002).

In 1998, atenolol was the most commonly used beta blocker (10.1 DDD/1,000/day) (AIHW 2001).

Results from the MONICA study estimate that around 20% and 18–25% of people aged 35–64 years in Perth and Newcastle respectively were treated with beta blockers before the coronary event, with this proportion increasing almost threefold during the coronary event in 1991–93 (Table 4.6). Treatment with beta blockers after discharge was estimated to be around 68–81% in Perth and 46–51% in Newcastle (AIHW: McElduff et al. 2000). In Perth, the use of beta blockers during the coronary event increased considerably between 1985–87 and 1991–93, while in Newcastle there was no significant increase over this period (Table 4.6).

Table 4.5: Prescription drugs used in the community by defined daily dosage (DDD), 1990–98

	1990	1991	1992	1993	1994	1995	1996	1997	1998
	DDD per 1,000 population per day								
ACE inhibitors	22.4	24.3	31.6	40.7	44.5	52.1	57.3	61.18	66.2
Beta blocking agents	29.0	24.2	24.2	23.1	21.5	21.6	21.4	21.2	21.3
Calcium channel blockers	24.3	26.1	30.4	33.3	35.5	40.5	44.2	47.1	46.5
Diuretics	89.3	68.7	68.4	64.6	61.0	60.0	58.6	56.8	56.2
Cholesterol and triglyceride lowering drugs	5.3	8.2	10.1	10.9	11.8	16.4	21.8	28.6	41.6
Antithrombotic agents	2.0	2.1	2.3	2.6	3.0	3.3	4.1	4.9	9.3
Antiplatelet drugs	0.5	0.6	0.5	0.4	0.5	0.6	0.9	1.4	5.5

Notes

1. No data available before 1990.
2. The Community Prescription Database combines the prescription estimates for the non-subsidised sector (under the general copayment and private prescriptions) from the Pharmacy Guild Survey with the actual counts of those prescription categories submitted to the Health Insurance Commission for payment of a subsidy.

Source: Community Prescription Database monitored by Drug Utilization Sub-committee, Commonwealth Department of Health and Ageing.

Calcium channel blockers

Calcium channel blockers cause blood vessels to dilate and are therefore effective in reducing blood pressure and angina. The use of calcium channel blockers has increased steadily in the 1990s with usage levels almost doubling between 1990 and 1998 (24.3 DDD/1,000/day in 1990 to 46.5 DDD/1,000/day in 1998) (Table 4.5).

Amlodipine and felodipine were the most widely used calcium channel blockers in 1998 (13.9 and 11.9 DDD/1,000/day respectively) (AIHW 2001).

Results from the 1991–93 MONICA study suggest that around 17–24% and 24–28% of patients in Perth and Newcastle respectively were treated with calcium channel blockers before the coronary event, with this proportion doubling to around 40% during the coronary event (Table 4.6). After discharge the proportion of patients treated with calcium channel blockers was around 23–29% in Perth and 36–41% in Newcastle (AIHW: McElduff et al. 2000). Between 1985–87 and 1991–93 the use of calcium channel blockers during the coronary event increased in Newcastle but declined in Perth (Table 4.6).

Diuretics

Diuretics are effective in reducing blood pressure. Diuretics also assist in the dilation of blood vessels and can be useful in the treatment of CHD. Diuretics are often used in combination with other drugs, usually ACE inhibitors. Although diuretics are still one of the most widely prescribed drugs for treating people with cardiovascular disease (56.2 DDD/1,000/day in 1998), their use has fallen substantially, by almost 40%, over the last decade. Between 1990 and 1991 the use of diuretics fell by around 23% and since then there has been a gradual decline in consumption between 1% and 6% per year (Table 4.5).

Table 4.6: Drug treatment before and during the coronary event, among 35–64 year-olds, MONICA study, 1985–87 and 1991–93

	Men				Women			
	Perth		Newcastle		Perth		Newcastle	
	1985–87	1991–93	1985–87	1991–93	1985–87	1991–93	1985–87	1991–93
	Per cent[a]							
Before the coronary event								
ACE inhibitors	1.5	10.2	3.1	18.1	2.6	18.6	5.3	15.1
Beta blocking agents	23.6	19.6	26.1	18.4	25.8	21.0	37.3	24.5
Calcium channel blockers	12.8	16.8	17.0	24.1	21.8	23.8	24.0	28.1
Diuretics	19.4	12.7	21.1	15.6	38.0	25.9	40.7	36.7
Aspirin[b]	7.3	19.7	12.0	21.0	9.3	15.5	10.0	19.1
During the coronary event								
ACE inhibitors	2.1	32.1	2.2	37.3	2.9	36.1	2.8	33.3
Beta blocking agents	59.6	78.3	45.1	53.3	49.3	66.0	39.9	47.3
Calcium channel blockers	53.2	38.0	21.1	39.5	58.1	41.2	22.1	42.6
Diuretics	43.6	34.2	36.9	32.4	56.1	46.8	40.5	48.2
Aspirin[b]	46.4	88.6	17.4	82.0	41.1	79.6	24.5	77.1

(a) Age-standardised using Australian MONICA populations.

(b) Data from 1985.

Source: AIHW: McElduff et al. 2000.

Frusemide was the most commonly prescribed diuretic in 1998 (22.6 DDD/1,000/day) (AIHW 2001).

Results from the 1991–93 MONICA study in Perth and Newcastle estimate that 13–26% and 16–37% respectively of patients aged 35–64 years were treated with diuretics before the coronary event, with this proportion increasing to 34–47% and 32–48% respectively during the coronary event (Table 4.6).

Cholesterol and triglyceride lowering drugs

Cholesterol and triglyceride lowering drugs are effective in preventing CHD in individuals with a history of cardiovascular disease. The use of cholesterol and triglyceride lowering drugs has increased substantially, with an eightfold increase in use between 1990 and 1998 (5.3 DDD/1,000/day compared with 41.6 DDD/1,000/day) (Table 4.5). The increase in consumption has been particularly rapid in more recent years. In a recent comparative study with 11 other countries conducted by the OECD, Australia had the highest per capita consumption of lipid lowering drugs. An increase in drug use occurred in all countries, although the magnitudes of this increase varied somewhat (OECD 2002).

Statins (HMG CoA reductase inhibitors) are recognised as the most effective drug in reducing cholesterol, and their use has increased dramatically since 1994 when their effectiveness was established conclusively in clinical trials. Simvastatin is the most widely prescribed lipid lowering agent (22.0 DDD/1,000/day) in 1998, followed by atorvastatin (11.0 DDD/1,000/day) (AIHW 2001).

Antithrombotic drugs

Antithrombotic drugs are used to prevent or treat blood clots and have been shown to be effective treatments for heart attacks. While discussion of these drugs may be more appropriate in the following chapter, which deals with medical treatment for people who have a heart attack, they have been included in this chapter for ease of reference.

The prescription of antithrombotic agents in the community has increased markedly over the last decade, with usage levels more than quadrupling between 1990 and 1998 (2.0 DDD/1,000/day in 1990 compared with 9.3 DDD/1,000/day in 1998) (Table 4.5).

Aspirin and other antiplatelet agents

Antiplatelet drugs, such as aspirin, ticlopidine and dipyridamole, interfere with the formation of blood clots. If given during a heart attack, aspirin reduces the risk of death, and if used long-term it reduces deaths and heart attacks among people with CHD. Between 1990 and 1995 the use of antiplatelet drugs remained relatively stable but it rose between 1995 and 1998, with the greatest rise in the last year (Table 4.5).

In 1998, the consumption of aspirin on prescription was 5.4 DDD/1,000/day. This is an underestimate of the overall consumption of aspirin in Australia as it excludes over-the-counter supply. Unfortunately, limited up-to-date data exist on the use of aspirin in Australia. Results from the MONICA study in Perth and Newcastle have shown, however, that over 80% of CHD patients who were discharged from hospital were being treated with aspirin, compared with around 19% of patients being treated with aspirin before the coronary event in 1991–93 (AIHW: McElduff et al. 2000).

Results from the MONICA study in Perth and Newcastle show a rapid increase in the use of aspirin among patients who were treated in hospital for a coronary event, with the proportion of such patients in Perth increasing from 41–46% in 1985 to 80–89%

in 1991–93. In Newcastle the use of aspirin increased from 17–25% to 77–82% over this period (Table 4.6). Furthermore, results from the MONICA study in Newcastle has shown that between 1983 and 1994 there was a substantial increase in the daily use of aspirin in the general population among men aged 35–64 years (2.5-fold increase), while among women there was no significant increase over this period (AIHW: McElduff et al. 2000).

Thrombolytic drugs

Thrombolytic drugs dissolve the blood clot responsible for the heart attack and are used to restore blood flow to the affected heart muscle to prevent or reduce the death of the muscle. For best results, these drugs must be given early during the heart attack, within 6–12 hours of onset. Unlike the other drugs mentioned in this section, these drugs are only given in hospital under close supervision. The traditional drugs of choice have been streptokinase and urokinase, and more recently tissue plasminogen activator (tPA) has been used. Thrombolytic therapy is often a first-line treatment for AMI as there is greater access for patients (the hospital does not need to be equipped with a cardiac catheterisation laboratory), shorter treatment times and ease of use for the physician.

Unfortunately, Australia does not have any national data on the use of thrombolytic therapy. However, data from the MONICA study suggest that among 35–64 year-olds, an estimated 43–46% and 37–43% of people suffering a heart attack in Perth and Newcastle respectively were treated with thrombolytics in 1991–93, a 5% increase per year since 1985 (AIHW: McElduff et al. 2000).

4.4 Discussion

This chapter has highlighted that over the last two decades there have been large improvements in the levels of some established risk factors for CHD, and substantial increases in the use of lipid lowering and other effective drugs such as ACE inhibitors. These factors would have largely contributed to the falls in heat attack rates that have occurred in Australia in past decades. A recent Australian study has indicated that aggressive medical treatment of people with elevated risk factors and established CHD could reduce the number of coronary events by 40%. The study estimates that 14,000 coronary events could be avoided each year if the average level of cholesterol in the population was reduced by 0.5 mmol/L, smoking prevalence halved, prevalence of physical inactivity reduced to 25% and the use of aspirin in people with established CHD was increased (McElduff et al. 2001).

Risk factors

Most Australians have at least one major modifiable risk factor for CHD (tobacco smoking, high blood pressure, overweight and obesity, or physical inactivity), and four in ten have at least two of these risk factors. Recent evidence suggests high blood cholesterol, high blood pressure and cigarette smoking explain about 75% of the occurrence of CHD in the population (Magnus & Beaglehole 2001; Stamler et al. 1999).

The analysis presented in this chapter also shows that people reporting heart disease have a higher prevalence of certain risk factors (such as overweight and obesity, high blood pressure and physical inactivity) than those without heart disease. While tobacco smoking increases the risk of CHD death, analysis from the National Health Survey indicates that people with heart disease are less likely to smoke than those without heart disease, suggesting that the strong advice from doctors and other health professionals to quit

smoking is having an effect. However, a major limitation with the risk factor analysis presented in this chapter is that the cross-sectional nature of the study does not allow for any assessment of cause and effect.

Trends and their effects on coronary heart disease levels

There is a mixed pattern of trends in the levels of major risk factors. Tobacco smoking and blood pressure levels have declined, blood cholesterol levels appear unchanged and levels of physical inactivity, body weight and diabetes have increased, the last two markedly. It appears that the favourable changes have been sufficient to outweigh the unfavourable changes, given the fall in CHD incidence noted. Estimates vary about the contribution of risk factor trends to the fall in CHD mortality. Hunink and others (1997) estimated that most of the decline in CHD mortality in the United States between 1980 and 1990 was explained by improvements in the management of CHD patients through risk factor reduction and improvements in treatment. However, Dobson and others (1999) estimated that the fall in major coronary events in the Hunter region of Australia between 1985 and 1993 could be fully explained by reductions in risk factors and increased use of aspirin.

Sex and age

Men are at a greater risk of CHD than women and the higher prevalence of modifiable risk factors among men supports this pattern. Men are more likely to have multiple risk factors and are more likely to smoke tobacco, be physically inactive, be overweight or obese and have diabetes than women are. Similar proportions of men and women had high blood pressure and high blood cholesterol.

Advanced age is also a risk factor for CHD, as reflected in the higher prevalence of most of these risk factors among the elderly. The prevalence of multiple risk factors and physical inactivity, high blood pressure, high blood cholesterol, overweight and obesity, and diabetes increases markedly with age up to age 65–74 years. Smoking rates, however, decline with age.

Drug treatment

Between 1990 and 1998 there were substantial increases in the use of lipid lowering drugs, and blood pressure lowering drugs such ACE inhibitors and calcium channel blockers. The use of diuretics and beta blockers declined over this period, perhaps because these drugs are relatively old and established drugs and more modern drugs, such as ACE inhibitors and calcium channel blockers are becoming increasingly popular for treating high blood pressure.

Between 1991 and 1998 there was a 23% increase in the use of drugs for treating high blood pressure in Australia. This may have contributed to the observed decline in the prevalence of high blood pressure among Australian adults aged 25–64 years (around 30% decline between 1989 and 1999–00). However, over this period there has also been a substantial reduction in average blood pressure levels among those not on medication for high blood pressure as well as those on treatment (AIHW 2001). For high blood pressure to be managed, lifestyle modifications are essential and can successfully diminish or eliminate the need for blood pressure lowering drugs (NHF 1999).

Although there have been substantial increases in the prescription of cholesterol and triglyceride lowering drugs between 1990 and 1998 (eightfold increase), data from national surveys suggest that there has been no reduction in the prevalence of high blood cholesterol or in average blood cholesterol levels in Australia between 1989 and 1999–00.

While current patterns in the use of aspirin in the general population are not known, data from the MONICA study suggest that the use of aspirin in the general community increased substantially between 1984 and 1993 (for men aged 35–64 years). The use of aspirin for treating CHD patients in hospital also increased rapidly over this period. Results from the International Study of Infarct Size (ISIS-2 study), released in the late 1980s, demonstrated that aspirin reduces mortality following a heart attack and this knowledge has been a significant factor in the increased use of aspirin and other antiplatelets during this period.