Immediate coronary care in general practice — a three-year review

H Baird

Accepted 15th August 1985.

SUMMARY
The general practitioners in a rural practice in a three-year period were called to 101 patients (25% female) who suffered a myocardial infarction. The average response time was 15 minutes. Seventeen patients collapsed and died and the 84 who survived the initial period were given immediate coronary care and either cared for at home, admitted by cardiac ambulance to a coronary care unit, or admitted to a general medical ward with monitor facilities. The four-week mortality rates were 21.0%, 21.5% and 57.7% respectively. Thirty-six patients required treatment for arrhythmias in the initial care period, of whom nine required defibrillation. This survey supports the view that patients over the age of 60 years with uncomplicated myocardial infarction may be cared for successfully at home.

INTRODUCTION
Ischaemic heart disease is the commonest single cause of death in the United Kingdom, and an estimated 150,000 people die each year from coronary heart disease. It has been recognised for many years that deaths following myocardial infarction are greatest in the first two hours and that 90% of these deaths are caused by ventricular fibrillation, a condition which is reversible when treated early.1 The general practitioner, particularly in the country areas, is well placed to have a direct influence on the morbidity and mortality rates of his patients following a myocardial infarction by providing immediate coronary care.

‘Immediate care’ may be defined as the provision of early comprehensive medical care by a skilled practitioner with appropriate equipment. The aims of this immediate care in the patient with an acute myocardial infarction are: (1) To prevent early death due to ventricular arrhythmias; and (2) To limit the size of the myocardial infarct by maximising and maintaining the coronary artery perfusion.

EQUIPMENT AND ORGANISATION
The equipment for general practice coronary care should be compact and easily portable. We were fortunate in this respect, because resuscitation equipment was already in use in the practice and was suitable for treating cases of cardiac arrest. An electrocardiogram had also been part of the practice equipment for the past ten years; this was easily portable and was suitable for use in a patient’s home. Three further items of equipment were required to complete the coronary kit. A battery-powered cardiac monitor, a Pantridge defibrillator, and a lightweight...
plastic 'implement box' were purchased. This box gave excellent access to drugs, syringes, needles, venous access cannulas and the monitor. The equipment is normally kept in the Health Centre ready for immediate use during working hours. Out of hours it is carried in the car of the doctor on call, which is equipped with a two-way radio. The doctor also carries a pager in his pocket when he is out of his car.

A protocol for patient management was initially agreed to ensure a conformity of patient care. The request for medical aid for a patient with a history suspicious of myocardial infarction was treated by the doctor on call as an emergency and on arrival the monitor was immediately attached to the patient's chest in order to establish the cardiac rhythm. Pain was relieved as soon as possible and a venous access cannula inserted to give rapid access for intravenous drug administration. The cardiac rhythm was stabilised and heart failure, if present, was treated. A 12-lead electrocardiograph was recorded in all patients to assist in the diagnosis and for future reference. A blood sample for cardiac enzymes was taken from the patient who was to be cared for at home. Criteria were agreed by the doctors to assist in deciding which patients were suitable for home care: these were a stable cardiac rhythm, controlled pain, age greater than 70 years (or under 70 with an onset more than 2 hours previously), suitable home conditions and agreement of both patient and relatives. Each case was assessed on its merits. The age of patients suitable for home care was reduced from 70 to 60 years at the six months' review of the original protocol, when several patients in this age group had already insisted on home care and were having an uncomplicated convalescence.

**DRUG THERAPY**

All drugs should be given intravenously, because the peripheral circulation is frequently impaired following myocardial infarction and this results in a slow absorption from an intramuscular injection site. Pain relief is obtained by giving diamorphine in sufficient quantity to relieve pain, normally 3 – 10 mg, the dose being titrated against the patient's response. The powdered diamorphine can be dissolved in cyclizine in order to control nausea and vomiting. Lignocaine in a dose of 50 – 100 mg given as a single injection, although not ideal, is the drug used at present to suppress ventricular ectopics or ventricular tachycardia. Sinus bradycardia (a rate under 50 beats/min) responds to atropine in doses of 0.3 – 0.9 mg and even in patients who have developed heart block will often increase the heart rate in the initial period. When bradycardia is due to prior treatment by beta blockade, no drug treatment is required except when hypotension (systolic BP < 100 mmHg) or ventricular ectopics occur. Ventricular ectopics occurring in a patient with bradycardia will frequently be eliminated as the heart rate increases.

Tachycardia (a rate excess of 110 beats/min) can be treated successfully with sotolol 5 – 10 mg or other beta-blocker, provided the tachycardia is not caused by left ventricular failure when a diuretic and possibly digoxin should be given first. The drug should be given slowly and titrated against the patient's response. Ventricular fibrillation is treated by direct current shock using a defibrillator. Prolonged ventricular fibrillation is associated with the development of acidosis which may be severe and requires intravenous bicarbonate. Sodium bicarbonate can conveniently be given in general practice by a pre-packed injection of 50 ml hypertonic sodium bicarbonate (50 mmol/50 ml). Sustained ventricular tachy-
Coronary care in general practice

Cardia which fails to respond to the injection of 100 mg lignocaine, especially when accompanied by a falling blood pressure, may require an unsynchronised direct current shock and intravenous bicarbonate.

RESULTS

A proforma was filled in by the attending doctor following each case; this was completed after 28 days or earlier if the patient died. One hundred and one patients (25% of whom were female) were attended in this series (Figure). Eleven patients were found to be dead on the doctor's arrival. Six others were severely shocked with marked cyanosis and systolic blood pressure less than 50 mmHg, all of whom failed to respond to treatment, and death followed within minutes from ventricular fibrillation and asystole. Cardiopulmonary resuscitation and defibrillating shocks were unsuccessful. Early deaths occurred in 17% of patients.

The age of patients ranged from 38 to 92 years with the most commonly affected group being 60 - 80 years. Eighty-four patients survived the initial period. Forty-two patients were transported by cardiac ambulance to a coronary care unit, nine of whom died, resulting in a mortality rate of 21.5 per cent. Fourteen patients with uncomplicated infarcts were admitted to a general medical ward, eight of whom died, a mortality rate of 57.7 per cent. Twenty-eight patients were treated at home with an age range of 59 to 92 years. Six of this group had to be subsequently transferred to a coronary care unit, four because of recurrence of chest pain (three due to a further ischaemic episode and one to pericardial involvement) and two because of change in home circumstances. Two of the transferred patients died in hospital and a further four of the group died at home, resulting in a mortality rate of 21 per cent. (Table I).

| Table 1 |
| --- |
| **Mortality rate by place of care** |

| Patients       | Deaths | Mortality |
|----------------|--------|-----------|
| Coronary care unit | 42     | 9         | 21.5%    |
| Home           | 28     | 6         | 21.0%    |
| General ward   | 14     | 8         | 57.7%    |

Patients aged from 60 to 79 years proved the most suitable groups for comparison and if patients with early complications were excluded (ie ventricular arrhythmias and cardiac failures) mortality rates of 20% and 19.1% were found for coronary care unit and home care. (Table II).

© The Ulster Medical Society, 1985.
Analysis of the 17 patients who died early showed that 11 of them (70.6 per cent), eight of whom had no previous history of heart disease, suffered a sudden collapse. Five of the six patients presenting with cardiogenic shock had a history of a previous myocardial infarction. The arrhythmias requiring treatment in the immediate care period (the initial period when under the care of the general practitioner before removal to hospital or before the general practitioner left the patient) were determined in 36 (36 per cent) of patients. Bradycardia was the commonest arrhythmia (14 per cent), with ventricular ectopics recorded in 4%. Ventricular fibrillation presented in nine patients (9 per cent), six of whom presented with cardiogenic shock. (Table III). Cardiac output was re-established in four of these and two patients survived longer than four weeks, giving a survival rate of 22 per cent. This compares with a published Belfast figure of 26 per cent.²

### TABLE III

| Early arrhythmias          |        |
|----------------------------|--------|
| Bradycardia                | 14 (14%) |
| Ventricular fibrillation   | 9 (9%)  |
| Tachycardia                | 5 (5%)  |
| Multiple ventricular ectopics | 4 (4%) |
| Atrial fibrillation        | 4 (4%)  |

**DISCUSSION**

The doctor's average response time, from receiving the call to arriving with the patient, over the three-year period was fifteen minutes. The mortality rate in the first four weeks for all myocardial infarctions in the practice area in the three-year period was 50 per cent. This is in line with the recent study of Wilson et al (1983)³ which compares two community mortality rates in the North of Ireland — one area served by cardiac ambulance and coronary care unit had a mortality rate of 47%, and the area not thus served had a mortality rate of 60%.

This survey supports the view that patients over the age of 60 years with uncomplicated myocardial infarctions have as good a chance of survival if they are cared for at home, provided pain is relieved and cardiac condition stabilised. The delay in request for medical aid still exceeds one hour on average, except in the group of patients who suffer from a sudden collapse. Many patients, if given the choice, would prefer home care to hospital care and there are also economic reasons for keeping patients out of hospital. The general practitioner has much to gain by providing high quality care both in the patients' estimation of his care and in his own self-esteem.

© The Ulster Medical Society, 1985.
General practice coronary care has an important part to play in the management of myocardial infarction, particularly in the areas not served by mobile coronary care and coronary care unit. This survey supports the view that patients with uncomplicated myocardial infarctions have as good a chance of long-term survival if cared for at home as in the coronary care unit.

I would like to thank my partners for their fortitude and attention to detail during the three years of the survey.

REFERENCES
1. Pantridge JF, Geddes JS. A mobile intensive-care unit in the management of myocardial infarction. *Lancet* 1967; 2: 172-173.
2. Pantridge JF, Webb SW, Adgey AAJ. Arrhythmias in the first hours of acute myocardial infarction. *Prog Cardiovasc Dis* 1981; 23: 265-278.
3. Mathewson ZM, McCloskey BG, Evans AE, Russell CJ, Wilson C. Mobile coronary care and community mortality from myocardial infarction. *Lancet* 1985; 1: 441-444.