

General practitioners' use of a mobile coronary care unit in a non-urban setting

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SUMMARY. The use that general practitioners made of the mobile coronary care unit operating from a district general hospital was monitored. Over half of the patients referred by their general practitioners to hospital with suspected acute myocardial infarction were removed by the mobile unit rather than by an ordinary ambulance. However, general practitioner selection of the more compromised patient for admission via the mobile unit indicated that the chance of this category of patient being admitted by the proven best means could be improved. Of the definite cases of infarcts removed to hospital by whatever means, the high proportion which were uncomplicated raises the question whether the general practitioner is attempting to select such patients for home rather than hospital care. The figures for the use of the mobile coronary care unit also indicate that education of the public remains an important task.

Introduction

Coronary heart disease is a major cause of death, especially in Northern Ireland, and there is evidence that it is increasing, particularly among men.¹ Acute myocardial infarction is a common complication of coronary heart disease and each episode is potentially fatal. In 1977 the number of deaths from acute myocardial infarction in Northern Ireland was 3,665. It has been shown that 50 per cent of all deaths from this cause occur within the first two hours after the onset of symptoms and that 70 per cent of all deaths occur outside hospital.² For these reasons, a medically manned mobile coronary care unit was set up in Belfast in 1966³ and now there are units of varying sophistication in operation throughout the province.

Mobile systems of care, which were developed because of the high initial mortality from myocardial infarction, have tended to operate in urban areas. Immediate resuscitation and defibrillation with rapid transfer to hospital has proved an effective strategy.³

The further development of mobile coronary care units, particularly in semirural areas, has identified problems of manpower and equipment as well as the appropriate selection of patients to be admitted from the community.^{2,3} The early use of simple portable defibrillators and improved accessibility to those at risk pose a challenge which the mobile coronary care unit may not be able to answer fully in semirural areas.^{4,5} It is of interest to know how mobile coronary care units are used in a rural area.

The study aimed to answer the following questions:

1. How do general practitioners and the public compare in the kinds of patients they refer to hospital via the mobile coronary care unit?
2. How do patients suspected of having an acute myocardial infarction and sent to hospital in the mobile unit by their general practitioner compare with those sent by other means of transport?
3. Does the severity of infarction have any relation to the general practitioner's decision to use the mobile coronary care unit rather than other transport?

Methods

Daisy Hill Hospital, Newry, is a district general hospital serving a largely rural area within a radius of 20 miles (32 km).

The population of the area is 76,000 (1980), 26,000 of whom live in the market town of Newry. There are 36 general practitioners in the area with an average 'list' size of 2,200 patients. Daisy Hill Hospital provides one of the 10 mobile coronary care units operating in Northern Ireland (Table 1).

Patients admitted to hospital with suspected acute myocardial infarction (that is, severe chest pain or sudden collapse) were studied over a one-year period (July 1981 to June 1982).

A total of 282 patients made up the sample population, which comprised all those for whom the mobile unit was requested plus those admitted directly to the coronary care unit via means other than the unit.

Each patient was placed into one of five categories relating to the final diagnosis as follows:

1. Definite acute myocardial infarction:
 - a) Uncomplicated;
 - b) Complicated and survived;
 - c) Complicated and died.

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2. Acute coronary insufficiency.
3. Angina pectoris.
4. Other pre-existing cardiovascular disorders (such as, heart failure and hypertension).
5. Other conditions (such as, asthma, epilepsy, alcoholic collapse).

Survival was taken to mean recovery and subsequent discharge from the hospital. Patients who died suddenly at home before the arrival of the mobile coronary care unit were not included because postmortem facilities were not available in the hospital at that time to establish an accurate diagnosis.

Having categorized the total sample as outlined above, the patients were then classified according to method of transport to hospital and whether their general practitioner or a lay person had requested the transport. No attempt was made to 'zone' patients with regard to place or location of incident.

Results

Table 2 indicates that nearly two thirds of requests for the mobile coronary care unit came from the general practitioner. The case-mix of the referrals from general practitioners differed significantly ($P < 0.001$) from the referrals from the public. Acutely ill patients—those with acute myocardial infarction or acute coronary

insufficiency—formed a higher proportion of referrals from general practitioners.

Table 3 categorizes suspected cases of myocardial infarction referred to hospital by general practitioners and compares the final diagnoses of those admitted via the mobile coronary care unit compared with other means of transport (most admissions were by ordinary ambulance). The case-mix of referrals from general practitioners differed from other means of transport ($P < 0.001$); acutely ill patients formed a higher proportion of those referred via the mobile unit.

Three quarters of patients with definite myocardial infarcts (64 out of 88 patients) referred by general practitioners were sent by the mobile coronary care unit, but severity of infarction did not vary significantly between those admitted via the mobile unit compared with other transport (Table 4).

Discussion

Our results indicate that general practitioners are more efficient users of the mobile coronary care unit than the lay public. While doctors and the public in the UK may be less enthusiastic users of mobile coronary care units than in the USA, we note the considerable improvements that can be achieved when resuscitation is attempted.⁶ Nevertheless, investigations in the UK have indicated that, after exclusion of patients with other specified medical and social reasons for hospital admission, patients can be managed with as much safety at home as in hospital.⁷ Given the desirability of involving

Table 1. Mobile coronary care units in Northern Ireland.

Health board and base hospital	Personnel
<i>Eastern</i>	
Royal Victoria	Doctor and student and/or nurse plus driver
Ulster	Doctor and nurse
<i>Northern</i>	
Waveney	Doctor, nurse, driver and possibly attendant
Coleraine	Doctor, nurse, driver and attendant
Mid-Ulster	Doctor, nurse, driver and possibly attendant
<i>Southern</i>	
Craigavon	Doctor, nurse, driver and attendant
Daisy Hill	Doctor, nurse, driver and attendant
South Tyrone	Doctor, nurse, driver and attendant
Kilkeel	Two general practitioners
<i>Western</i>	
Altnagelvin	Doctor, nurse and driver

Table 2. Number of patients admitted via mobile coronary care unit: final diagnosis by source of referral. (Percentages in parentheses.)

Final diagnosis	GP referral	Lay person referral
Acute myocardial infarction	64 (58.2)	17 (27.4)
Acute coronary insufficiency	24 (21.8)	6 (9.7)
Angina pectoris	12 (10.9)	16 (25.8)
Other cardiovascular disorders	8 (7.3)	5 (8.0)
Other diagnoses	2 (1.8)	18 (29.1)
Total	110 (100)	62 (100)

χ^2 (4df) = 42.01; $P < 0.001$

Table 3. Number of patients referred by general practitioners: final diagnosis by type of transport. (Percentages in parentheses.)

Final diagnosis	Mobile coronary care unit	Other means of transport
Acute myocardial infarction	64 (58.2)	24 (26.7)
Acute coronary insufficiency	24 (21.8)	10 (11.1)
Angina pectoris	12 (10.9)	28 (31.1)
Other cardiovascular disorders	8 (7.3)	16 (17.8)
Other diagnoses	2 (1.8)	12 (13.3)
Total	110 (100)	90 (100)

χ^2 (4df) = 38.54; $P < 0.001$

Table 4. Number of patients referred by general practitioners (definite infarcts): severity of infarction by type of transport. (Percentages in parentheses.)

Severity of infarction	Mobile coronary care unit	Other means of transport
Uncomplicated	32 (50.0)	12 (50.0)
Complicated and survived	21 (32.8)	9 (37.5)
Complicated and died	11 (17.2)	3 (12.5)
Total	64 (100)	24 (100)

χ^2 (2df) = 0.35. Not significant.

the public and informing them about how to react to the acute cardiac presentation, it is essential that their 'false alarm' rate (29 per cent) should be reduced.

Examination of the transport employed by general practitioners to admit patients with suspected acute myocardial infarction indicates their ability to select the more compromised patients for mobile coronary care transport. However, when patients with definite acute myocardial infarction are considered, this selectivity is removed. Further investigation of this use of the mobile coronary care unit should be made, as other studies have noted that home care of this type of patient has as much to offer as hospital care,^{8,9} especially if more than two hours have passed since onset of the attack. It was also disconcerting to find that patients referred with a complicated infarct did not have a significantly greater chance of receiving appropriate and expert management through the intervention of a mobile coronary care unit. Despite the fact that patient delay in summoning help is a major problem,² rapid assessment, control of cardiac rhythm and pump function, and appropriate placement of the patient (not necessarily admission to hospital) is essential. In the absence of knowledge about how many patients with acute cardiac problems were managed at home, comment about the appropriateness of general practitioners' use of the mobile coronary care unit should be the subject of further study.

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