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Is the National Service Framework standard for thrombolytic therapy achievable in a rural area?

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Summary

The National Service Framework (NSF) for coronary heart disease requires that patients with acute myocardial infarction should start thrombolytic therapy within 60 min of the patient making contact with the National Health Service. In an audit of 700 patients with suspected acute myocardial infarction, patients' first contact was most commonly with a general practitioner (GP) (505/700; 72 per cent), who attended on 88 per cent (446/505) of occasions when they were called. In 93 per cent (255/284) of cases where both GP and an ambulance attended, the GP arrived first, by 25 min (median). In the final audit period, median call-to-thrombolysis time was 90 min (26 per cent ≤60). We conclude that with existing physical and personnel resources in this semi-rural area of Northern Ireland, the NSF standard for thrombolytic treatment is unlikely to be met in a majority of cases unless GPs adopt prehospital thrombolysis.

Keywords: acute myocardial infarction, thrombolytic therapy, time factors, prehospital

Introduction

The National Service Framework for coronary heart disease lays down rigorous performance standards for the management of patients with acute myocardial infarction.[1] Although they apply only to England, they are likely to be adopted by the other regions of the United Kingdom. Standard 5 requires that a defibrillator, and somebody trained to use it, should be available within 8 min of the patient calling for help, and standard 6 requires that thrombolysis should be given within 60 min; opiate should be given prehospital.

In this paper we report an audit of the early management of acute myocardial infarction using National Service Framework standards. After identifying and correcting areas of underperformance, we wanted to see whether with existing local physical and personnel resources the present hospital-based strategy for giving thrombolytic treatment is likely to allow the standards to be met in the majority of cases.

Participants and methods

The Downe hospital is situated in the market town of Downpatrick and serves a catchment area extending 15 miles with a total population of some 60000. It has an accident and emergency department, acute medical and surgical wards, and a nine-bedded coronary care unit, and it supports a medically staffed cardiac ambulance. General practitioners (GPs) may admit patients directly to the wards or coronary care unit, or direct them to the accident and emergency department. General practitioners do not give thrombolytic treatment themselves, and at the beginning of the audit this treatment was given only by coronary care unit staff either in the unit or in the cardiac ambulance.

Patients included in the audit were identified by having the operational diagnosis of suspected myocardial infarction on admission to hospital.

Audit data on 700 consecutive patients were collected between September 1999 and February 2001. There were three interim analyses with feedback of results to the project board, and frequent informal discussions of the results with hospital staff and GPs. This report covers three audit periods: September–November 1999 (n = 110), December 1999–August 2000 (n = 400) and September 2000–February 2001 (n = 190).

During the course of the audit there were several changes in practice, including streamlining procedures within the coronary care unit, administration of thrombolytic treatment by accident and emergency department staff, increased use of opiate prehospital, and greater use of the cardiac ambulance.

Results

First contact

The first contact made by patients with the NHS was most commonly with a GP (505/700; 72 per cent), followed by the accident

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and emergency department (112/700; 16 per cent) or a 999 call to the ambulance service (83/700; 12 per cent); GPs attended on 88 per cent (446/505) of occasions when they were called. The GP was with the patient before the ambulance arrived in 93 per cent (255/274) of instances where both attended, by a median of 25 min.

Delays from call to treatments

Median delays from call to treatments in the three audit periods are shown in the Table. Where patients made their own way to the accident and emergency department the time of attendance there counts as the time of 'call'. There were non-significant fluctuations in median call-to-defibrillator times between the three audit periods but no consistent pattern.

Between periods 2 and 3 call-to-opiate times fell where the GP was the first contact because of increased opiate usage by GPs; by period 3 median call-to-opiate time was 30 min. Opiate was also given more rapidly in the accident and emergency department in the last audit period.

Call-to-thrombolysis times showed substantial falls in all categories, but especially where patients were admitted via the accident and emergency department having attended there themselves or having been taken there following a 999 call for an emergency ambulance. Previously, patients admitted via the accident and emergency department were not given thrombolytic treatment until after transfer to the coronary care unit, but staff of the accident and emergency department commenced giving thrombolytic treatment in the department towards the end of the first audit period.

Comparison with NSF standards

In the Figure the percentages of patients achieving NSF standards are shown. Only for opiate prehospital does a majority of patients achieve the standard.

Table Median delays to treatments

	Period 1	Period 2	Period 3
First contact general practitioner			
Call-to-defibrillator (min)	42	37	50
Call-to-opiate (min)	45	46	30
Call-to-thrombolysis (min)	137	120	90
First contact accident and emergency			
Call-to-defibrillator (min)	–	–	–
Call-to-opiate (min)	37	30	14
Call-to-thrombolysis (min)	62	27	27
First contact 999			
Call-to-defibrillator (min)	12	15	11
Call-to-opiate (min)	60	69	50
Call-to-thrombolysis (min)	211	100	77
All patients			
Call-to-defibrillator (min)	27	25	29
Call-to-opiate (min)	45	46	30
Call-to-thrombolysis (min)	126	104	90

Discussion

In this study of 700 patients with suspected acute myocardial infarction, the diagnosis of an acute coronary syndrome was confirmed in 511, and there was one survivor from out-of-hospital cardiac arrest. In the majority of cases (72 per cent) GPs were the first contact, and they attended rapidly. Mostly, however, they did not have defibrillators with them when on call, and defibrillation was not possible until arrival of an ambulance. The median call-to-defibrillator interval was thus prolonged at 40 min, and where a GP was the first contact only 6 per cent of call-to-defibrillator intervals were ≤8 min. Had the GPs in our study had defibrillators with them when on-call, as many as 10 additional survivors from out-of-hospital cardiac arrest might have been expected.

In the first audit period the proportion of patients receiving opiate at any time in their illness and who were given it prehospital was only 54 per cent, but by period 3 it had increased to 76 per cent because of increased usage by GPs (Figure).

Because opiate was almost always given by a doctor in person at the patient's side, the call-to-opiate time gives an indication of the earliest opportunity when thrombolytic treatment might be given. In the last audit period, median call-to-opiate time was 30 min where the first contact was a GP.

When thrombolytic treatment is given in hospital, there are two components to the call-to-thrombolysis time, the call-to-door time and the door-to-thrombolysis time. In the second and third audit periods, median door-to-thrombolysis time was 27 min for patients treated in the accident and emergency department and in the coronary care unit following direct admission there. This figure is similar to the best published door-to-needle times of 25–30 min.[2,3] In urban areas the shortest call-to-door times reported are about 30 min.[4,5] So a 'scoop and run' policy where patients call 999 and are taken in an emergency ambulance to hospital can be expected to give at best a median call-to-thrombolysis time of 60 min; 50 per cent of individual times will

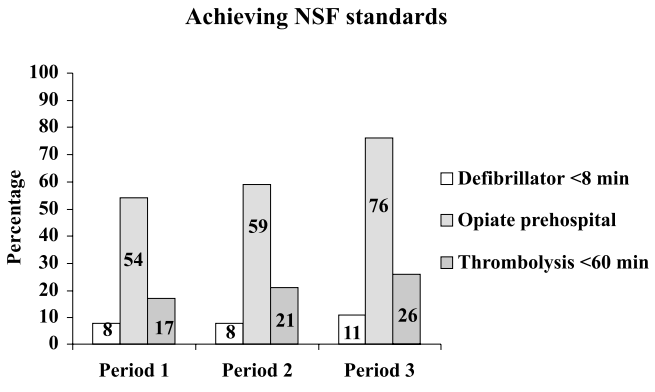

Figure Percentages of patients achieving NSF standards for availability of a defibrillator within 8 min, receiving opiate prehospital, and receiving thrombolysis within 60 min of calling for professional help, in three audit time periods.

be longer than the standard.[6] In suburban and rural areas call-to-door time will be longer than 30 min, and it was 48 min in this study, giving a best estimate call-to-thrombolyis time of 75 min. A 'scoop and run' strategy must therefore be rejected as a means of enabling a majority of patients to meet standard 6 in these areas.

Where a GP was the first contact, the call-to-door interval was considerably longer at 77 min, ruling out eventual hospital thrombolysis as an appropriate strategy in these cases, who constituted a large majority.

In some cases in this study, thrombolytic treatment was given by a doctor in the cardiac ambulance, at a median call-to-thrombolysis time of 60 min. In most of these cases the cardiac ambulance was called out by a GP who, on average, was with the patient 25 min before the ambulance arrived. Although an improvement on 'scoop and run', this strategy does not achieve standard 6 in a majority of cases, and violates the 'as urgent as cardiac arrest' principle, involving multiple triage and a transfer of care between one doctor and another.[7] The assessment of a patient's diagnosis and eligibility for thrombolytic treatment takes an appreciable time, and the assessment has to be repeated if the patient's care is transferred before thrombolysis is started.

In this study 72 per cent of patients' first calls were to a GP, higher than reported from urban areas, but typical of rural areas throughout the United Kingdom. The earliest opportunity when thrombolytic treatment might have been given is indicated by the call-to-opiate time of 30 min recorded in patients who were seen by a GP. The same call-to-opiate time was reported by GPs in a rural area of Scotland, where the median call-to-thrombolysis time for GP administration was 45 min, and 74 per cent of times were within 60 min.[8] Administration of thrombolytic treatment by GPs thus appears to be the strategy that offers most promise of achieving the National Service Framework standard in a majority of cases in rural areas.

This conclusion accords with the acute hospitals review group report on the provision of medical services in Northern Ireland, which recommends a more prominent role of GPs in emergency medical care, in particular by providing defibrillation and thrombolysis in rural areas.[9]

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