Despite its proved advantages, uptake of prehospital thrombolysis by general practitioners (GPs) in rural areas of Scotland has been poor. Some of the practical difficulties could be surmounted if GPs were assisted by ambulance paramedics trained and equipped for the management of acute myocardial infarction. This team working is the essence of “dual response”, a model of care proposed in 1994 by the British Heart Foundation but not implemented until now. In this project “dual response” was evaluated against the National Service Framework (NSF) standard of 60 minutes call to needle time.

PARTICIPANTS, METHODS, AND RESULTS

Twenty three ambulance locations were selected for inclusion in the project on the basis of distance from hospital (>30 minutes), adequate paramedic staffing, and expression of interest by local GPs. Patients from these areas were referred to seven district general hospitals (DGH). A protocol for immediate management of suspected acute myocardial infarction was agreed, and a training package developed and used in 20 one day joint workshops for GPs and paramedics. Ambulances in the participating centres were equipped with 12 lead electrocardiographs and provided with tenecteplase, the thrombolytic agent selected for use by local health boards; the GP was responsible for prescribing thrombolysis.

Patients were patients from the catchment areas who were given thrombolysis, whether prehospital or in hospital; baseline data collection was started several months before the project went live. For our purposes, the definition of a “dual response” was the use of tenecteplase provided by the ambulance crew, which necessarily required cooperation between paramedic and doctor.

Between December 2000 and November 2003, data were collected on 584 patients given thrombolytic therapy, of whom 46 received tenecteplase carried by the ambulance service. The median call to needle time for these patients was 48 minutes, and 78% (35 of 45) of times were ≥60 minutes. In some regions prehospital thrombolysis was already being given by GPs before the project went live; the median call to needle time for these other models of prehospital thrombolysis was 45 minutes, and 73% (135 of 186) of times were ≤60 minutes.

Of patients receiving thrombolysis in hospital, only 2% (7 of 329) achieved the NSF target, with a median call to needle time of 135 minutes. After the introduction of “dual response”, the proportion of patients receiving prehospital thrombolysis increased from 34% (77 of 227) to 45% (160 of 357), median call to needle time decreased from 115 to 95 minutes, and the proportion of patients meeting the NSF standard increased from 27% (56 of 207) to 34% (121 of 352).

Figure 1 shows that in these rural communities, the first call was most often for a GP (72%), and 88% of patients were seen by a doctor before referral to a DGH. Where both GP and ambulance attended, the GP was there first on 87% of occasions.

COMMENT

Introduction of “dual response” resulted in a small increase in the proportion of patients receiving prehospital thrombolysis, and a modest reduction in call to needle time, which was, however, still far short of the NSF standard. The availability of paramedic assistance resulted in the recruitment of additional GPs willing to give thrombolytic treatment, but despite of the availability of this new service, most patients did not receive thrombolysis until after admission to hospital, more than two hours after professional help had been sought. As most of the patients receiving thrombolysis in hospital would have been eligible to receive it in the community from the “dual response” team, this contact with a doctor and paramedic represents an opportunity that, passed up, will have resulted in many avoidable deaths.

In view of the extent of GPs’ involvement with patients with acute myocardial infarction, it will be challenging to provide an adequate service in rural areas after introduction of the new General Medical Services contract, which permits practices the opportunity of opting out of out of hours cover. It seems likely, however, that a limited number of GPs working in cooperatives will be available, and it is important

Abbreviations: NSF, National Service framework; DGH, district general hospital; GP, general practitioner
that they should be able to initiate thrombolytic treatment as
they are most often first on scene in rural areas. Other models
include thrombolysis administered by ambulance paramedics
using telemedicine decision support from a specialist centre.5

In remote and rural areas thrombolytic treatment must be
given prehospital if the NSF standard is to be attained.
According to local circumstances prehospital thrombolysis
should be provided by GPs working autonomously, “dual
response”, or paramedics with telemetry support.

ACKNOWLEDGEMENTS
We are grateful for the assistance of audit staff in Aberdeen Royal
Infirmary, Belford Hospital Fort William, Borders General Hospital,
Dr Grays Hospital Elgin, Dumfries and Galloway Royal Infirmary,
Raigmore Hospital Inverness, and Western Isles General Infirmary.

CONTRIBUTORS
AM conceived the study and obtained funding. Both authors
contributed to the training package and took part in training
workshops. JR collated and analysed the results; both authors wrote
the paper. JR is guarantor.

Authors’ affiliations
J Rawles, Brunnion Minor, Lelant Downs, Hayle, UK
A Marsden, Scottish Ambulance Service, National Headquarters,
Edinburgh, UK

Funding: NHS Scotland Remote and Rural Areas Resource Initiative
(RARARI); educational grants from Boehringer Ingelheim and Roche
Pharmaceuticals.

Conflicts of interest: none declared.

Ethical approval was not required for this study. The study was
conducted, concluded, and reported independently of the funders.

Correspondence to: Dr J Rawles, Brunnion Minor, Lelant Downs, Hayle
TR27 6NT, UK; john.rawles@btinternet.com

Accepted for publication 30 July 2004

REFERENCES
1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis
2 Rawles JM, Ritchie LD. Thrombolysis in peripheral general
practices in Scotland: another rule of halves. Health Bull
1999; 57: 10–16.
3 Weston CFM, Penny WJ, Julian DG on behalf of the British Heart Foundation
Working Group. Guidelines for the early management of patients with
4 Department of Health. National service framework for coronary heart
coronary.htm).
5 Pedley DK, Bissett K, Connolly EM, et al. Prospective observational
cohort study of time saved by prehospital thrombolysis for ST
elevation myocardial infarction delivered by paramedics. BMJ
Impact of "dual response" on prehospital thrombolysis in remote and rural areas of Scotland: prospective observational study
J Rawles and A Marsden

doi: 10.1136/emu.2004.014506

Updated information and services can be found at:
http://emj.bmj.com/content/21/6/720

These include:

References
This article cites 3 articles, 2 of which you can access for free at:
http://emj.bmj.com/content/21/6/720#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Topic Collections
Articles on similar topics can be found in the following collections

- Clinical diagnostic tests (1056)
- Radiology (1002)
- Resuscitation (606)
- Acute coronary syndromes (197)
- Pacing and electrophysiology (39)
- Stroke (244)

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/