

## PREHOSPITAL CARE

# Impact of "dual response" on prehospital thrombolysis in remote and rural areas of Scotland: prospective observational study

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Despite its proved advantages,<sup>1</sup> uptake of prehospital thrombolysis by general practitioners (GPs) in rural areas of Scotland has been poor.<sup>2</sup> 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.<sup>3</sup> In this project "dual response" was evaluated against the National Service Framework (NSF) standard of 60 minutes call to needle time.<sup>4</sup>

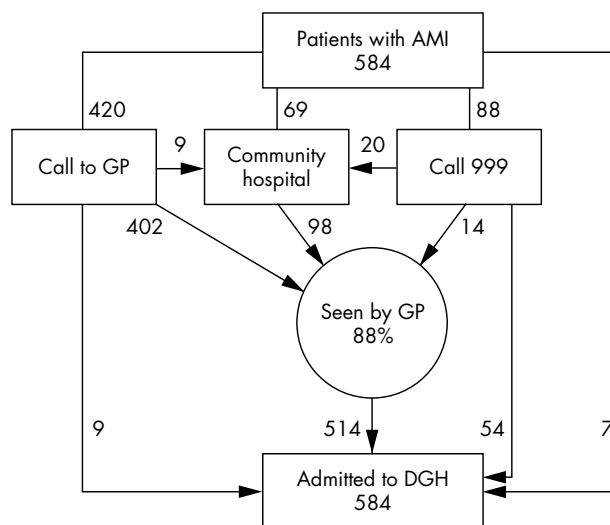
### PARTICIPANTS, METHODS, AND RESULTS

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.

Participants 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  $\geq 60$  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  $\leq 60$  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



**Figure 1** Flow chart showing the routes by which 584 patients given thrombolysis for AMI were admitted to a DGH.

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.<sup>5</sup>

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.

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### 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.

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