

# Self admission for myocardial infarction

## *Controlled trial*

P C REYNELL

*From Bradford Royal Infirmary, West Yorkshire*

**SUMMARY** In a randomised controlled trial of 511 men under 65 followed for 1451 man/years, half the patients were invited to readmit themselves to hospital if ischaemic pain recurred. The majority of such patients who were readmitted took advantage of the scheme. There was no evidence that they admitted themselves unnecessarily. Time from the onset of pain to admission was significantly reduced in those who made use of the scheme. All of the seven successful resuscitations among patients readmitted occurred in those who had bypassed their general practitioner and secured admission within two and a half hours of the onset of pain.

Death from ventricular fibrillation occurs most often during the first few hours after the onset of myocardial infarction. Earlier admission to a coronary care unit where facilities for resuscitation are available might be expected to reduce the number of deaths. Attempts have been made to educate the public to react more quickly to severe pains in the chest<sup>1</sup> and a recent trial from Nottingham<sup>2</sup> suggests that such a programme may have a limited effect on the speed of admission.

Unfortunately few patients can be expected to understand the significance of ischaemic pain until they have been seen by a doctor. There is, however, one group of patients who might be expected to recognise such pain correctly, namely those who have already experienced it. Currently available evidence does not suggest that patients with second infarcts report symptoms any earlier than those with first infarcts,<sup>3,4</sup> but if these patients were encouraged to admit themselves promptly to hospital it might be that patient delay would be minimised and doctor delay abolished.

A randomised controlled trial was therefore undertaken to discover whether such a scheme could be easily organised, to what extent patients would make use of it, and whether it shortened admission time.

### **Methods**

It was first necessary to obtain the co-operation of

general practitioners in the district and of the ambulance service and the consent of the ethical committee. These were readily forthcoming. In the interests of homogeneity the trial was confined to men under 65. Reasons for exclusion were as follows: (1) domicile outside the district; (2) no easy access to a telephone; (3) heart failure or serious complicating disease; (4) imperfect command of English; (5) psychological instability.

When a patient was judged eligible for the trial, he was allocated to trial or control group by a system of sealed envelopes. Those allocated to the trial group were invited to ring for an ambulance if they got a severe pain lasting more than 20 minutes and their names and addresses were supplied to the ambulance depot. The potential advantages of early admission were explained verbally by the consultant in charge of the unit and a written reminder slip was also provided.

The progress of all patients was assessed by annual postal follow-up from their general practitioners. For any patient readmitted, the time from the onset of pain to arrival in the coronary care unit was estimated as accurately as possible. The complete study comprised 1451 man/years of follow up. There were 255 patients in the trial group and 256 controls. Twenty-one patients were lost from follow-up, usually because they had moved from the district.

### **Results**

The scheme ran smoothly and there were no serious

Table 1 Number of readmissions subdivided according to method of admission

|              | Patients readmitted | GP admissions | Casualty admissions | Total admissions |
|--------------|---------------------|---------------|---------------------|------------------|
| Trial series | 62                  | 34            | 67                  | 101              |
| Controls     | 56                  | 72            | 23                  | 95               |

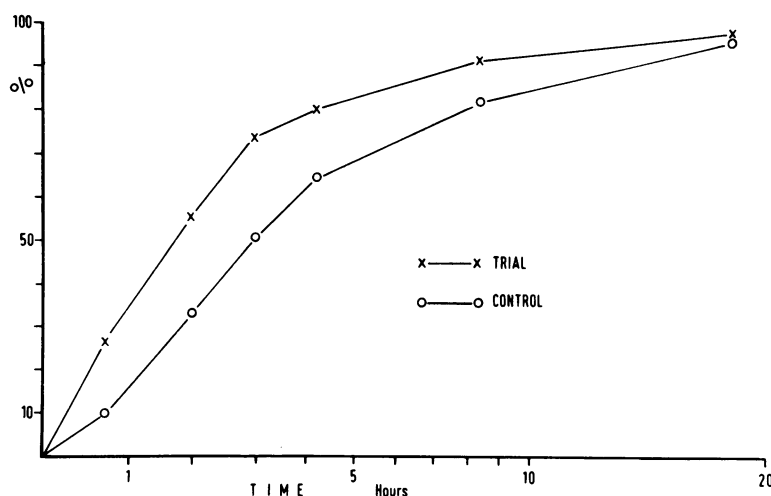


Fig. 1 Cumulative admission times for patients in trial and control groups.

Table 2 Admission delays in trial and control series subdivided according to method of admission

| Admission delay (hours) | Trial group   |                     |                  |              | Control group |                     |                  |              |
|-------------------------|---------------|---------------------|------------------|--------------|---------------|---------------------|------------------|--------------|
|                         | GP admissions | Casualty admissions | Total admissions | Cumulative % | GP admissions | Casualty admissions | Total admissions | Cumulative % |
| 0-1½                    | 1             | 25                  | 26               | 26.8         | 2             | 7                   | 9                | 9.9          |
| 1½-2½                   | 6             | 22                  | 28               | 55.7         | 14            | 7                   | 21               | 33           |
| 2½-3½                   | 6             | 11                  | 17               | 73.2         | 11            | 5                   | 16               | 50.6         |
| 3½-5                    | 3             | 3                   | 6                | 79.2         | 11            | 1                   | 12               | 63.8         |
| 5-12                    | 9             | 2                   | 11               | 90.5         | 17            | 1                   | 18               | 83.6         |
| 12-25                   | 5             | 2                   | 7                | 97.7         | 9             | 1                   | 10               | 94.7         |
| Over 25                 | 1             | 1                   | 2                | 100          | 5             | 0                   | 5                | 100          |

administrative problems. Some patients were readmitted several times, but this occurred in both trial and control groups and there was no evidence that the system was abused in the sense that patients admitted themselves frivolously or unnecessarily. In the trial group 62 patients were readmitted 101 times and in the control group 56 patients were readmitted 95 times. Some patients were readmitted for causes other than ischaemic pain, but for the purpose of this study admissions were only scored if the patient complained of pain in the chest.

#### UTILISATION OF SCHEME

The extent to which patients made use of the scheme was reasonably satisfactory. In the control group the patient was admitted by a general practitioner on 72 of

95 occasions and on only 23 occasions was he admitted via the casualty department. In the trial group, on the other hand, only 34 of 101 admissions were arranged by a general practitioner. The other 67 admissions came through the casualty department and the great majority of these had rung for an ambulance as advised (Table 1). It is not known, however, how many patients experienced ischaemic pain and either took no action or sent for their own doctor who kept them at home.

#### ADMISSION DELAYS

In all but eight readmissions it was possible to make a rough estimate of the time from the onset of pain to admission to the coronary care unit (admission time). Cumulative admission times (Fig. 1 and Table 2)

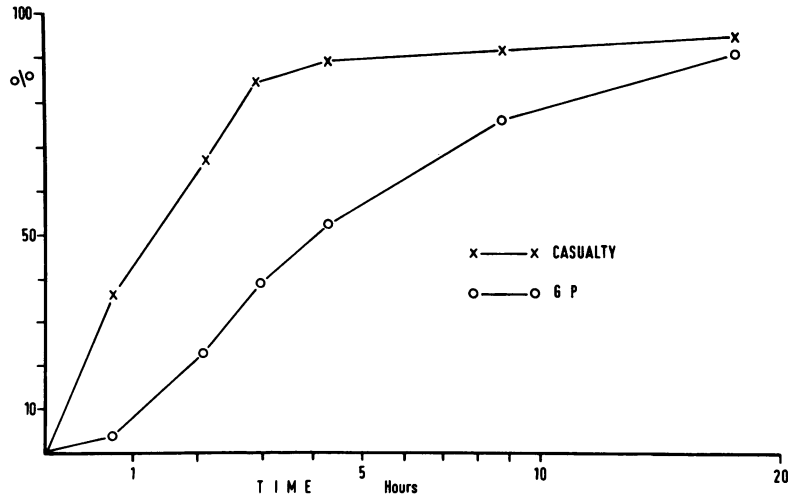


Fig. 2 Cumulative admission times for patients admitted by general practitioners and those admitted directly through the casualty department.

Table 3 Comparison of GP and casualty admissions in combined trial and control series

|                     | Number | Less than 2½ hours | Resuscitations |
|---------------------|--------|--------------------|----------------|
| GP admissions       | 100    | 23                 | 0              |
| Casualty admissions | 88     | 61                 | 7              |

show clearly that admission delay was reduced in the trial group as compared with the controls. In 54 of 97 readmissions in the trial group, admission time was less than two and a half hours compared with 31 of 91 controls ( $p < 0.01$ ). Fig. 2 and Table 3, however, show that the most striking difference was between those of either group admitted by doctors and those admitted through the casualty department without having seen a doctor. Only 23% of the former were admitted within two and a half hours of the onset of pain whereas 69% of the latter were admitted within this time.

#### EMERGENCY RESUSCITATIONS

The purpose of the scheme was to secure earlier admission in the hope that a few patients might then develop ventricular fibrillation in hospital rather than at home and then be resuscitated. It is therefore relevant to study those patients who developed ventricular fibrillation and were then resuscitated and survived to leave hospital. There were only seven such patients (four in the trial group and three among the controls), far too small a number for statistical analysis. Nevertheless, if the two groups are pooled, it is of interest that on all seven occasions patients successfully resuscitated bypassed the general practitioner and were admitted to the casualty department, either

by sending for an ambulance or by some other means. On all seven occasions the interval between the onset of pain and arrival in the coronary care unit was less than two and a half hours. This lends support to the suggestion that rapid admission without reference to a general practitioner may occasionally be life saving.

#### Discussion

Coronary ambulance services have been organised to try and secure early admission for patients with myocardial infarction. But there are conflicting views on their practicability and cost effectiveness and for various reasons few centres have followed the example of the pioneers. The major components of delayed admissions are patient delay (the time between the onset of pain and the cry for help) and doctor delay (delay in sending for an ambulance). The more modest objective of this trial was to secure earlier admission for a selected group of patients likely to recognise the significance of ischaemic pain without medical assistance.

Some patients with a variety of medical and surgical illnesses do send directly for an ambulance rather than call their general practitioner. Ambulance staff then usually try to contact the patient's own doctor before taking him to hospital unless he is obviously very ill. If the ambulance service is supplied in advance with the names and addresses of patients who have been advised to readmit themselves this delay can be avoided. At some centres such an arrangement is already in operation for patients with severe recurrent asthma. This trial shows that a similar scheme can easily be organised for patients who have had a myocardial infarct.

If patients are encouraged to make use of such a scheme, a reasonable proportion of them will do so. This proportion will depend on the degree of persuasion exercised. A mere written handout from ward sister or house physician is unlikely to be very effective. Some patients will always turn first to their own general practitioner in time of trouble, but the results of this trial would have been more convincing if a higher proportion of the patients had been persuaded to send for an ambulance rather than a doctor. Such a scheme is so easy to arrange that it may be worth considering for patients thought to be at special risk, such as those who have had serious arrhythmias in hospital and those with abnormal pre-discharge exercise tolerance tests.

#### References

- 1 McNeill GP, Bouchier IAD, Watson H. Mobile coronary care available to the general public (letter). *Lancet* 1979; **i**: 975.
- 2 Rowley JM, Hill JD, Hampton JR, Mitchell JRA. Early reporting of myocardial infarction: impact of an experiment in patient education. *Br Med J* 1982; **284**: 1741-5.
- 3 Schroeder VS, Lamb IH, Hu M. The prehospital course of patients with chest pain. *Am J Med* 1978; **64**: 742-8.
- 4 Erhardt LR, Sjögren A, Säwe U, Theorell T. Prehospital phase of patients admitted to a coronary care unit. *Acta Med Scand* 1974; **196**: 41-6.

Requests for reprints to Dr P C Reynell, 12 Park View Road, Bradford, West Yorkshire BD9 4PA.