



Mortality in patients given thrombolytic treatment at home or in hospital

treatment without electrocardiographic confirmation of the diagnosis.

In Stuart J Pocock and David J Spiegelhalter's interpretation of our mortality data¹ the estimate of the prior probability of a reduction in mortality by giving treatment two hours earlier is derived from trials in which thrombolytic treatment was given in hospital at the first opportunity. But the relation between outcome and time of administration of the treatment is not a true reflection of its efficacy at different times. The outcome will be biased against indicating greater efficacy with earlier administration because of the greater severity of infarction in patients presenting earlier.² Only in a trial with a design such as ours, in which patients are randomly allocated to receive treatment immediately on presentation or after a delay, can the importance of delay be determined. We acknowledge that three month mortality was not a predetermined end point and, indeed, that ours was not a mortality end point trial, but we would have been remiss not to draw attention to the mortality we found (figure).

Though agreeing that we were lucky in our result, we do not agree that a 50% reduction in mortality can be dismissed as implausible: a reduction of similar magnitude was found in the European myocardial infarction project in patients in whom the saving in time to treatment was over 90 minutes (A Leizorowicz, personal communication).

JOHN RAWLES

Medicines Assessment Research Unit,
University of Aberdeen,
Medical School,
Aberdeen AB9 2ZD

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Second International Study of Infarct Survival Collaborative Group. Randomised trial of intravenous streptokinase, oral aspirin, both, or neither among 17 187 cases of suspected acute myocardial infarction: ISIS-2. *Lancet* 1988;ii:349-60.
- 3 Wilcox RG, von der Lippe G, Olsson CG, Jensen G, Skene AM, Hampton JR. Trial of tissue plasminogen activator for mortality reduction in acute myocardial infarction. Anglo-Scandinavian study of early thrombolysis (ASSET). *Lancet* 1988;ii:525-30.
- 4 Sanderson JE. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1014. (24 October.)
- 5 Pocock SJ, Spiegelhalter DJ. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1015. (24 October.)
- 6 Rawles JM, Mercalf MJ, Shirreffs C, Jennings K, Kenmore ACF. Association of patient delay with symptoms, cardiac enzymes, and outcome in acute myocardial infarction. *Eur Heart J* 1990;11:643-8.

EDITOR,—As general practitioners who contributed to the Grampian region early anistreplase trial¹ we are disappointed that correspondents' response to the trial has been so negative.²

A C H Pell and K A A Fox say that delay can be reduced by using an ambulance summoned by a 999 call and a hospital "fast track" system. We

suspect that if this system was adopted their fast track system would soon be overwhelmed by the huge number of patients with musculoskeletal and spurious chest pain who are currently screened out by general practitioners. The hypothesis that this would be a better way of giving coronary care is, in their own words, untested. Care of patients with acute myocardial infarction entails not only resuscitation and thrombolysis but also relief of pain, management of cardiac failure, and treatment of arrhythmias. It is unthinkable that patients should be encouraged to bypass their general practitioner and so have these problems left untreated before making a journey by ambulance. This system would be even less applicable to patients living outside cities.

The Grampian trial was a well planned and conducted, classically designed double blind placebo controlled trial. Further studies of this type are not likely to be done and are not needed. Early coronary care by general practitioners, including thrombolytic treatment, has been shown to be highly effective. Will general practice now rise to the challenge, and will our cardiological colleagues give us the support we need?

R W LIDDELL

Health Centre,
Turriff,
Aberdeenshire

S ROBERTSON

Health Centre,
Fyvie AB53 8QD

A G SINCLAIR

Jubilee Hospital,
Huntly AB54 5EX

G GORDON

Medical Centre,
Fraserburgh

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Correspondence. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1014-5. (24 October.)

EDITOR,—We recently completed a feasibility study of a system to reduce delays to patients receiving thrombolysis that may be considered complementary to the GREAT Group's study.¹ Ambulance crews were trained to assess patients by clinical questionnaire and by recording pulse and blood pressure. Electrocardiograms were recorded by computer assisted analyser and transmitted to the coronary care unit by cellular telephone. After discussion with nursing staff in the unit the ambulance staff took patients with a high likelihood of acute myocardial infarction directly to the unit.

Forty nine consecutive patients with chest pain were assessed and transported to hospital. Eight patients did not have an electrocardiogram recorded (because they did not consent or were not in pain); for these patients the mean time from the ambulance's arrival at the scene to departure was 6.25 minutes. For the 41 patients who had electrocardiograms recorded the mean time from the ambulance's arrival at the scene to departure was 18.75 minutes. Eleven of the 49 patients had an acute myocardial infarction confirmed by enzyme values.

Ambulance crews were required to liaise with the coronary care unit's nursing staff by means of the telephone link. Among the 11 patients subsequently confirmed to have had an acute myocardial infarction the nursing staff assessed the electrocardiogram transmitted as confirming acute myocardial infarction in five patients, equivocal or not indicating acute myocardial infarction in three, and failure of transmission in one; one patient refused electrocardiography. One patient with an inferior myocardial infarction was incorrectly assessed as not having infarction. The medical staff diagnosed a high likelihood of acute myocardial infarction in six patients, who were considered for

thrombolysis. One further patient was given thrombolysis; enzyme values did not rise importantly, the system identified five of the patients with acute myocardial infarction, who were redirected to the coronary care unit despite an open access system for general practitioner referrals. For these patients the reported in hospital assessment and transfer delays were thus avoided.^{2,3}

Our study shows that ambulance crews can reliably assess patients presenting with chest pain and record a 12 lead electrocardiogram. In liaison with the coronary care unit's nursing staff they reliably identified patients with a high likelihood of acute myocardial infarction. Thus the system may be of value in supporting the administration of thrombolysis in the community by general practitioners and in reducing delays by promoting direct admission to the coronary care unit for both self referrals and general practitioner referrals.

In our catchment area there are 140 general practitioners who would require access to a defibrillator and electrocardiographic equipment. There are only two frontline responding ambulances, and thus only three electrocardiographic units, including the coronary care unit's base unit, and cellular telephone units need to be provided. All frontline ambulances in Scotland have defibrillators.

PETER H SEIDELIN

Department of Medical Cardiology,
Royal Infirmary,
Glasgow G31 2ER

BARRY D VALLANCE

Department of Medical Cardiology,
Hairmyres Hospital,
East Kilbride

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Pell ACH, Miller HC, Robertson CE, Fox KAA. Effect of "fast track" admission for acute myocardial infarction on delay to thrombolysis. *BMJ* 1992;304:83-7.
- 3 Birkhead JS. Time delays in provision of thrombolytic treatment in six district hospitals. *BMJ* 1992;305:445-8. (22 August.)

Thrombolytic treatment for elderly patients

EDITOR,—As Andrew T Elder and Keith A A Fox point out,¹ elderly patients suffering from acute myocardial infarction are often treated differently from younger patients and sometimes are not given thrombolytic treatment for reasons that are not clearly justifiable.

J S Birkhead collected data only on patients admitted to coronary care units and does not give any information about their ages.² Studies in Britain have suggested that a fifth of these units set an upper age limit for admission.³ A recent survey of attitudes to the management of acute myocardial infarction in Wales found that no hospitals admitted to having a formal age related policy governing admissions to the coronary care unit or use of thrombolysis. Despite this, a significant association between younger age (<70) and admission to a coronary care unit (17/20 (85%) v 14/29 (48%), $p=0.02$) and use of thrombolytic treatment (17/20 (85%) v 15/29 (52%), $p=0.01$) was found (S Arino for Senior Registrar Geriatric Study Group, British Geriatric Society's spring meeting, Swansea, April 1992).

An audit of 251 consecutive elderly patients admitted to two teaching hospitals in Cardiff found that of 223 patients able to give information, 126 were admitted to hospital within 12 hours (median 185 minutes). The "decision time" was 90 minutes. This interval was considerably influenced by the patients' interpretation of the likely cause of their symptoms. Similarly, the time taken for a general practitioner to respond to a call was much shorter if the patient had a history of ischaemic heart disease. Other factors had no great influence. Ambulances

took a median of 30 minutes to arrive at the patient's home and 20 minutes to reach the hospital. When the same variables were analysed in the patients subsequently confirmed to have definite or probable acute myocardial infarction it was found that the decision time was shorter if relatives were with the patient at the onset of symptoms.

The interval between admission to hospital and administration of streptokinase in those given the drug was the longest single delay (median 102 minutes). No factors were identified that significantly influenced the time of administration of streptokinase.

Thus most elderly patients reach hospital in time to benefit from thrombolytic treatment but many elderly patients are not admitted to coronary care units. Not only must attention be given to shortening the time to administration of thrombolytic treatment but elderly patients with suspected acute myocardial infarction should have the potential benefit of specialised coronary care.

S ARINO
A BAYER

University Department of Geriatric Medicine,
Cardiff Royal Infirmary,
Cardiff CF2 1SZ

- 1 Elder AT, Fox KAA. Thrombolytic treatment for elderly patients. *BMJ* 1992;305:846-7. (10 October.)
- 2 Birkhead JS. Time delays in provision of thrombolytic treatment in six district hospitals. *BMJ* 1992;305:445-9. (22 August.)
- 3 Dudley NJ, Burns E. The influence of age on policies for admission and thrombolysis in coronary units in the United Kingdom. *Age Ageing* 1992;21:95-8.

EDITOR,—Andrew T Elder and Keith A A Fox highlight the issue of age and thrombolytic treatment in myocardial infarction.¹ The medicine for the elderly unit at Burnley operates an age related policy, admitting all patients aged 71 and over presenting as medical emergencies. We have only limited access to the coronary care unit. We started using thrombolytic treatment over four years ago and participated in the third international study of infarct survival. This further exacerbated problems of access to the coronary care unit. Attempts to give this treatment in a busy general ward caused inordinate pressure on the nursing and medical staff, particularly at weekends and nights.

An audit of myocardial infarction in January and February 1991 showed that of the 41 patients diagnosed as having myocardial infarction, only five received thrombolytic treatment. In 10 the diagnosis could not be made on admission and became apparent when electrocardiography was repeated the next day. Nineteen patients had clear contraindications. In seven patients no reason was apparent for their not receiving thrombolysis. Lack of suitable monitoring and pressure on medical and nursing time were identified as reasons for the poor results. We therefore implemented a vigorous policy of training junior medical staff and started to plan a high dependency unit in our department to provide monitoring facilities and trained nursing staff to supervise the administration of thrombolytic treatment as well as other critically ill patients.

A repeat audit in January and February this year showed considerable improvement. Fifteen patients out of 43 received thrombolytic treatment, but the number of missed early diagnoses was still large because of lack of monitoring facilities. We opened a four bedded high dependency unit in June this year. A preliminary analysis of the first 100 admissions to the unit showed that 44 patients were diagnosed as having myocardial infarction. In 12 patients myocardial infarction was not immediately evident on admission but became apparent during early monitoring. Twenty nine patients were given thrombolytic treatment. All patients who were eligible received the treatment; we have no upper age limit. The rate of complications has been no higher than expected.

In elderly patients with myocardial infarction the diagnosis is often unclear on presentation, and monitoring these patients has enabled us to establish the diagnosis and to give thrombolytic treatment if appropriate. We are undertaking a formal study of outcomes, including length of stay and function. The development of a high dependency unit devoted exclusively to elderly people has enabled us to give our patients the proved benefit of this treatment.

V P HAJELA
S K SINGH
L J PATTERSON

Medicine for the Elderly Unit,
Burnley Health Care NHS Trust,
Burnley General Hospital,
Burnley BB10 2PQ

- 1 Elder A, Fox KA. Thrombolytic treatment for elderly patients. *BMJ* 1992;305:846-7. (10 October.)

Communicating with patients

EDITOR,—Information for patients, always a neglected topic, has now become one of patients' rights embodied in the patient's charter. Since 1983 Brighton Health Authority has been committed to producing good quality literature as part of a consumer affairs initiative and has won national recognition for its publications for patients.

We looked at the written material given to patients from wards, outpatient clinics, community clinics, health centres, and other departments in the health district. A doctor and a non-medical researcher formed a joint opinion on the visual appearance, content, factual accuracy, style, and presentation of each item. They awarded an overall grade to each item according to whether it was acceptable or needed revision. They then did a readability test on a random sample.

The volume of material available was surprising, though the response from the mental health sector was disappointing. Subjects covered included information for patients before a procedure and after a procedure, information on health promotion topics, and general information. We divided the publications into the following categories: in house (produced by the department concerned, 356), professional organisation (produced outside the health authority and NHS but including the Health Education Authority, 247), pharmaceutical companies (192), self help groups or charities (30), the district health promotion department (22), and miscellaneous (91).

Of the in house literature, 246 items were considered to be unacceptable and 10 to be in urgent need of attention. Two hundred and seventeen publications had been photocopied, of which 171 were of a poor standard, usually because photocopies had been taken of photocopies. Fifty three items of in house material lacked a department or subject heading, logo, or date so that the information had no context. Seventy one items were considered to be unfriendly; instructions were brusque and dictatorial, almost to the point of being rude—a failing accentuated when the text was in note form, especially if abbreviations were used and there was no introduction. Twenty eight publications were considered to be too technical because they used medical terms and jargon unnecessarily or without explanation.

A particularly poor example was a leaflet for women going home after a hysterectomy. The front cover featured an inappropriate, tasteless cartoon of a chicken wearing an apron and a chef's hat stirring a pot, with the title "Your recipe for home." There was no department heading, logo, or date. The first page had a list of contents with no page numbers; it was followed by a description of what the patient was to expect postoperatively,

Information for patients should:

- have the department heading, the date, and the health authority logo
- have an introduction and a list of contents with page numbers if appropriate
- have all text in sentences, without abbreviations, jargon, or complicated medical terms
- be professionally printed or at least produced on a word processor
- have short paragraphs with double spacing between them. Numbering of paragraphs may be helpful
- be photocopied from the original material
- be assessed by as many medical and non-medical people as possible before reproduction

illustrated with anatomical diagrams. The explanation then continued in question and answer form: "Although my womb has been removed, my ovaries have been left behind. As I have not reached the 'change of left' [sic], do I still need to use contraceptive [sic]. The simple answer [sic] is no. The womb as [sic] an incubator for the developing [sic] baby, so without it pregnancy is impossible."

A random sample of leaflets was selected and tested for readability by the "gobbledegook" test. This is a rough measure of readability for adult readers based on the principle that long sentences and polysyllabic words are harder to understand. Unfortunately, words such as diabetes, alcohol, and cholesterol were often found in the leaflets; and many other factors that affect readability—such as sentence structure, print size, and the educational background of the reader—are not taken into account by readability tests. Of the 524 leaflets selected, 96 were not suitable for the test because they consisted of diet sheets or lists of addresses. Twenty five had a score rating them as "very hard to read," on a level with the *Times* and the *Guardian*, and therefore unsuitable for the general reader.

As a result of the study all departments were sent a code of good practice (box) and told that the public relations officer was available for advice. New leaflets will soon replace the 10 leaflets considered to be in most urgent need of redesign. In house literature is valuable, but departments must follow guidelines and districts must set aside realistic budgets for producing good quality patient information. This will then complement the clinical care that patients receive.

J BENNETT
P BRIDGER

Brighton Health Authority,
Brighton General Hospital,
Brighton BN2 3EW

Outcome of breech delivery at term

EDITOR,—The reply of J G Thorpe-Beeston and colleagues¹ to the criticisms of their paper on the risks of term breech delivery² emphasises the importance of antenatal counselling. While accepting that it is difficult to propose a policy decision on the basis of their study, they advocate the use of their perinatal mortality figures when advising women about vaginal breech delivery. In their original paper they state that many women would find a figure "approaching 1%" disturbing and would opt for caesarean section. In their letter they suggest that women may find a risk presented as "no more than 1%" acceptable. This is a good illustration how the same statistic can be used to influence a patient's decision in either direction, and that a hidden statistic, the doctor's attitude, may be more important than the quoted figure