

Thrombolysis and the general practitioner

1 *Practicable only under certain circumstances*

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If thrombolytic treatment represents the second major advance in the management of patients with acute coronary thrombosis, will it gain more widespread acceptance in prehospital treatment than the other major advance, defibrillation? For more than 20 years it has been clear that almost half of the early deaths from myocardial infarction occur within the first two hours, and yet we have failed to provide a mechanism by which early ventricular defibrillation may be achieved. The advent of thrombolytic treatment may provide the necessary impetus for major revision of the prehospital management of acute coronary occlusion.

Should family practitioners give thrombolytic agents in a patient's home? The key underlying questions are whether such treatment confers benefit, whether it could be achieved promptly—that is, within the first hour—and whether the advantages outweigh the potential hazards.

Benefits of thrombolytic treatment

The evidence to support the use of thrombolytic treatment is now overwhelming,^{1,5} and the benefits of thrombolysis diminish as the time delay lengthens after the onset of symptoms.^{1,3} For example, in the GISSI study streptokinase treatment within the first three hours was associated with the greatest improvement in mortality (12.0% controls, 9.2% streptokinase), and a subset analysis of patients treated within the first hour showed a dramatic reduction in mortality of about 47% (15.4% controls, 8.2% streptokinase).¹ A similar relation with time was shown in the second international study of infarct survival (ISIS-2): treatment within the first hour resulted in 13.4% mortality with placebo and 8.1% with streptokinase treatment.³ The odds of death were further reduced by the addition of aspirin, but the temporal relations were less pronounced with aspirin. Even in a study of this size (17 187 patients) the numbers of deaths after early

treatment were relatively small and hence the confidence intervals do not allow firm conclusions to be drawn with respect to treatment within the first hour. Nevertheless, in view of substantial experimental evidence, injury will be minimised and recanalisation more common with early thrombolysis.^{6,8} Further clinical studies of very early treatment are required, but according to current evidence delay in treatment increases myocardial injury and the risks of death, and hence rational policies must aim at minimising the delay.

Advantages versus hazards of treatment

Can delays be minimised by general practitioners giving the thrombolytic agent in a patient's home? Studies in Britain^{9,11} and elsewhere¹²⁻¹⁴ show that patients receive treatment in hospital more rapidly after direct access or an emergency call to the ambulance or paramedical ambulance service than by calling out the family practitioner. Some general practices may be able to arrange for a doctor to be immediately available to attend patients with suspected infarction and for him or her to be trained and familiar with thrombolytic treatment and modern methods of resuscitation and to carry an electrocardiograph and defibrillator. For most practices, however, the fairly low frequency of myocardial infarction (on average two to three cases of myocardial infarction are seen by each general practitioner a year) may make this approach impracticable. Although the risks of major adverse events after thrombolytic treatment are fairly low, the family practitioner must be prepared to deal with potentially life threatening complications. These include anaphylaxis and hypotension, rhythm disturbances, and all of the acute complications of myocardial infarction. In patients seen early after acute myocardial infarction the incidence of ventricular fibrillation is higher; although thrombolytic treatment reduces the overall incidence

EDITORIAL COMMENT

Thrombolytic treatment given very early in the course of a myocardial infarct can save a life, but thrombolytic treatment given in certain other conditions that could be confused with a myocardial infarction could take a life. Hospital doctors who see patients with myocardial infarctions virtually every day may still sometimes get the diagnosis wrong and most general practitioners see only a couple each year. It must also be recognised that there are side effects which themselves can sometimes be life threatening: hypotension or anaphylaxis are the most important. I would be reluctant to give a thrombolytic drug at home unless an electrocardiogram showed clear evidence of myocardial infarction and some delay in removal to hospital was

likely. In urban areas the concept of a mobile coronary care unit is attractive, but it is not new and unfortunately has not yet caught on. In rural areas the doctor may have to give thrombolytic treatment if the patient is to receive this treatment when it will be useful. Nevertheless, the wisdom of still performing an electrocardiogram seems strong, and the doctor should be prepared to deal with major side effects should they occur. If an electrocardiogram performed at home shows normal results, or one is not available, aspirin should be given (provided that there is no contraindication) and the patient dispatched to hospital.—PETER C RUBIN, *professor of therapeutics, University of Nottingham*

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Contraindications to thrombolytic treatment (guidelines)

- Risk of bleeding—recent trauma, major surgery, or head injury (within six weeks)
 - gastrointestinal haemorrhage
 - symptoms of proved peptic ulceration (within three months)
 - bleeding diathesis or chronic liver disease with portal hypertension
- Allergy (streptokinase or anistreplase)—previous treatment with either drug between five days and 12 months
- Stroke (residual disability) or transient ischaemic attack within six months
- Pregnancy

Relative contraindications

- Serious organic disease associated with increased risk of bleeding or embolisation
- Uncontrolled hypertension—systolic pressure >200 mm Hg or diastolic pressure >110 mm Hg
- Non-compressible arterial puncture—within 14 days
- Dental extraction within 14 days
- Active menstruation or lactation
- Prolonged cardiopulmonary resuscitation
- Diabetic proliferative retinopathy.

of ventricular fibrillation and sudden death, these results obscure the early incidence of ventricular fibrillation. Thus far trials of early treatment have been small, but they suggest an early incidence of ventricular fibrillation which cannot be ignored.^{15 16}

Should the diagnosis of myocardial infarction be clinical and not necessitate an electrocardiogram? Early electrocardiograms may fail to show the characteristic changes of infarction. By the time a patient reaches hospital, however, normal results on electrocardiography are associated with an extremely low risk of mortality^{3 4} and yet all of the risks of thrombolytic treatment still exist, especially if an alternative diagnosis is present. Thus, particularly outside hospital, the administration of a thrombolytic agent to a patient with normal results on electrocardiography is unwise.

Advanced life support training for ambulance staff has been shown to be practicable and effective. In Brighton more than half of the patients are treated within the first two hours after the onset of symptoms of myocardial infarction. Thus in urban communities a "999 advanced life support" ambulance system may provide the most expeditious means of transferring a patient to hospital and providing thrombolytic treatment immediately after arrival.

Important limitations to patients being admitted as emergencies directly to hospital include the lack of information from the family practitioner and the lack of adequate (opiate) analgesia. Ideally, the ambulance service should be called at the same time as the general practitioner and attend with a defibrillator with an electrocardiographic readout and thrombolytic drug. The drug may then be given under the guidance of the general practitioner and the patient transferred to hospital with the aid of the advanced life support ambulance team. This combined approach would allow administration of appropriate analgesics and obviate the need for practitioners to carry infusion equipment and expensive and labile thrombolytic drugs.

Conclusions

The case for thrombolytic treatment is overwhelming and the evidence to support early treatment is sub-

stantial. Current patterns of referral show that patients would be treated more rapidly by emergency or direct admission than by general practitioners at home. In isolated or rural communities family practitioners may need to take responsibility for thrombolysis and give the treatment in community hospitals. In urban communities an integrated approach with the advanced life support ambulance system and the family practitioner may be ideal. Domiciliary administration of thrombolytic agents by the family practitioner may be practicable, however, only if he or she is prepared, trained, and equipped to provide an individualised intensive care service within a patient's home.

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