Thrombolysis, the general practitioner, and the electrocardiogram

The British Heart Foundation Working Group on the early management of myocardial infarction has stated that—"General practitioners initiating thrombolytic treatment outside hospital need to be fully aware of the indications, contraindications, and side effects of such treatment and should have a defibrillator available. They should confirm the diagnosis by a 12-lead electrocardiogram."

Should general practitioners give thrombolysis?
General practitioners participating in the GREAT study responded quickly to patients with suspected myocardial infarction and administered thrombolytic drugs reliably, safely, and effectively some two hours before they would have received this treatment in hospital. The British Heart Foundation Working Group concluded that it is appropriate for general practitioners to administer these drugs if, by doing so, patients with definite myocardial infarction will receive them an hour or more earlier than they otherwise would. In many areas, this proviso will not apply because patients will be treated more promptly if they send for an ambulance rather than for their doctor.

Any general practitioner who plans to give such treatment should know its indications and contraindications, be able to record and interpret an electrocardiogram, and have access to a defibrillator. But what if these conditions do not obtain, especially if a general practitioner cannot for one reason or another obtain or read an electrocardiogram?

Is the electrocardiogram a useful guide to thrombolytic therapy?
The electrocardiogram is an invaluable tool for determining the probable effectiveness of thrombolytic therapy. If the clinical picture is one of myocardial infarction within 6 hours of its onset and the electrocardiogram shows ST elevation or bundle branch block, thrombolysis will save the life of some 3% of patients to whom it is given. If the electrocardiogram is normal or shows various less specific abnormalities (including ST depression) the mortality benefit, if any, is probably less than 1%

But an electrocardiogram taken soon after the onset of infarction is not reliable
The electrocardiogram may be normal or non-diagnostic soon after the onset of infarction, yet show typical changes later. This emphasises the need to repeat the electrocardiogram frequently in those with a high likelihood of infarction, rather than to use thrombolytic therapy when the diagnosis is so uncertain.

ST elevation can, of course, be misleading. It may be the residue of old infarction or a transient feature of ischaemia in the absence of infarction. When the ST elevation disappears after the administration of a thrombolytic our more enthusiastic colleagues are apt to claim that they have aborted an infarct; they may have aborted a phantom infarct. None the less, it is as well to retain ST elevation as an important indication for thrombolysis because the benefits of giving it in these circumstances greatly outweigh the risks.

Has no electrocardiogram the same significance as a normal electrocardiogram?
It has often been assumed that, because it is inappropriate to give thrombolysis if the electrocardiogram is normal or near normal, it is wrong to give such treatment if there is no electrocardiogram. This does not follow, because the probability of infarction benefiting from thrombolysis is different in the two circumstances. If a patient with known ischaemic heart disease has experienced unstable angina leading to an episode of severe typical infarction pain, there is perhaps a 50% chance that the electrocardiogram would show ST elevation or bundle branch block.

How accurate is the diagnosis of myocardial infarction in the absence of an electrocardiogram?
In a study of general practitioners in the Taunton area, the diagnosis of myocardial infarction was confirmed in 36 of the 100 patients in whom it was suspected. The practitioners rated their certainty of the diagnosis on a 1–10 scale. Only 46% of those graded 10 (certain of the diagnosis) proved to have a myocardial infarction. In the GREAT study, in which an electrocardiogram was not a requirement for entry into the trial, 61% of those recruited were finally classified as having definite or probable infarcts. However, because the general practitioners recorded an electrocardiogram at the time of entry, it is difficult to know how they were influenced by its findings.

Perhaps a more relevant question here is not how accurate general practitioners without electrocardiograms are in diagnosing all infarctions, but how accurate they are in recognising those infarctions for whom thrombolysis should be given. In the study of Gemmill et al from Glasgow only 18 out of 49 patients whom the practitioner thought appropriate for thrombolysis on clinical grounds were found in hospital to have the indications for it. The choice of patients for thrombolysis was not improved by trying to record an electrocardiogram; these practitioners had not, however, received instruction in interpreting electrocardiograms. More evidence is needed on the accuracy of suitably trained general practitioners in recognising suitable cases with and without an electrocardiogram before one could recommend that they should administer thrombolysis on clinical suspicion alone.

What are the risks of inappropriate thrombolysis?
Thrombolysis can cause serious adverse effects. Some of these, such as reperfusion ventricular fibrillation and early rupture, are peculiar to patients with recent infarction, but the more common and serious bleeding complications, especially haemorrhagic stroke, are as common in patients without infarction as they are in patients with the
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difficulty in
recognising anterior
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the presence of
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bundle branch block—a
diagnosis that often
defeats
MRCP candidates. Another
important issue was identified
by
Gemmill
et al in
Glasgow.6 In this study, general
practitioners obtained satisfactory
electrocardiograms in
the
60% of cases. This may have
been owing to
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use of the machine; electrical
interference seems to
have been
a major problem, as were
patient movement
and
tremor artefact. These
difficulties can be
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most cases and do not seem
to have troubled
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GREAT investigators.
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exceptional general practitioners
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but they are a
minority. But is it so
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