found that pre-treatment with clopidogrel significantly reduced the periprocedural event rate and also the long-term outcome. Interestingly, the patients benefited from clopidogrel before the revascularization, in the same way as in the CURE main trial.

Husted and colleagues have introduced a new way to better protect patients awaiting revascularization for unstable coronary artery disease: a bridge over troubled water. However, the therapeutic strategy is still not fully clear: is it low molecular weight heparin, oral anticoagulation, clopidogrel or a combination?

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Late is perhaps not . . . too late for primary PCI in acute myocardial infarction

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The short and long-term prognosis after myocardial infarction depends on infarct size, which itself depends on the quality and rapidity of reperfusion. Thus, quality and rapidity are the master words in terms of coronary recanalization.

Myocardial reperfusion can be achieved with either pharmacological means (fibrinolytic drugs) or mechanical means (percutaneous coronary intervention (PCI). In terms of quality, it is now well established that PCI is superior to thrombolysis. Normal anterograde flow (TIMI 3) can be obtained in around 90% of patients with balloon angioplasty alone and this has been further improved with the use of coronary stenting as demonstrated by several recent studies (PAMI-stent, PASTA, ESCOBAR[1-3]). Even the most effective fibrinolytic agents achieve TIMI 3 flow in only 55-60% of patients. The combination of a fibrinolytic agent with adjunctive therapy such as a GpIIb/IIIa receptor blocker may improve the early TIMI 3 flow rate (up to 72-75%). Nevertheless, the rate of TIMI 3 flow obtained with medical reperfusion is, by far, inferior to that routinely obtained with mechanical reperfusion i.e. by PCI.
In other words and in terms of quality of reperfusion, PCI is superior to medical treatment and, as a result, the clinical benefit, as judged by the mortality rate, is less with modern PCI than with modern thrombolysis. The meta-analysis of 10 randomized trials comparing these two methods of recanalization show that the mortality rate at 30 days is on average 4-4% with PCI and 6-5% with fibrinolysis (OR 0.66 (95% CI 0.46-0.94); P<0.02), although these data were obtained before the era of liberal adjunctive stenting.[9]

However, the general applicability of these results requires consideration of two factors. It has been shown that the results of primary PCI in the setting of AMI depend on the experience of the operators and, even more so, on the volume of procedures performed in a centre. The results of a low-volume centre are similar to those obtained with thrombolysis. Secondly, the time elapsed from door to balloon is greater than the time from door to needle. It is easier to inject a drug intravenously than to organize an effective programme of mechanical recanalization.

Thus the speed factor favours medical treatment, particularly when the initial treatment is achieved with a simple bolus injection performed in the emergency ambulance. The benefit of pre-hospital thrombolysis has been convincingly demonstrated. Thus there is still a dilemma: to be quicker or to get a better result?

Felix Ziljstra and colleagues address this problem elegantly in a paper in this issue concerning the clinical outcome and characteristics of patients who presented at different times after symptom onset.[5] They studied a series of 2635 patients who were enrolled in 10 randomized trials of primary angioplasty (n=1302) compared to thrombolytic therapy (n=1333). These patients were classified into three groups according to the time elapsed between onset of symptoms and presentation (initial medical care/treatment) which was clearly identified in 95% of these patients. Three groups were defined: early presentation: <2 h, intermediate presentation (2–4 h), late (>4 h) presentation. The same proportion of patients 32%, 39% and 24%, respectively, was observed with the two modalities of treatment.

It is interesting to note that delayed presentation was associated with age, gender, diabetes and increased heart rate. Except for the latter item, the other variables are not unexpected. It is well established that older patients and women are often reluctant to seek medical attention and that diabetics more frequently present with silent myocardial infarction, leading frequently to delayed diagnosis.

But the most interesting point of the study is the clinical outcome: Figs 1 and 2 of Ziljstra’s study clearly show that the major event rate significantly increases with increasing time from symptom onset to presentation in patients allocated to thrombolytic therapy.[5] At 1 month follow-up, the major adverse cardiac event rate increased from 12.5% when thrombolysis was performed in the early time period to 19.4% in cases of a late presentation (>4 h). There was apparently no difference between patients treated with streptokinase or with r-TPA. The detrimental impact of late presentation is already well known and late fibrinolytic treatment has been discouraged in this setting. However, it is more interesting to note that this is not the case in the group of patients allocated to PCI. The rate of MACE is lower than in the thrombolytic group and relatively stable (6 to 9%) whatever the time of presentation.

In other words, even with late presentation, there was a beneficial effect if primary PCI was undertaken, while this was not the case if thrombolysis was the initial treatment. This finding differs from previous observation. Brodie et al. found that in AMI patients treated with PTCA the mortality rate was 4.3% when the patient was treated within the first 2 h and doubled when angioplasty was performed between 2 and 4 h or later.[6] These differences could result from different classifications of the time frames involved. Ziljstra’s meta-analysis considered the time from onset of symptoms to admission which is different from the time elapsed between onset of chest pain and the beginning of revascularization, i.e. introduction of the guide wire into the infarct related vessel.

This finding is of interest because many physicians favour thrombolysis over PCI because of the overall significantly shorter time to treatment than transfer to a centre with coronary angiography and angioplasty facilities, based on the fact that delay to treatment has consistently been shown to have a pre-eminent impact on mortality, independent of the treatment chosen (pharmacological vs mechanical). A second potential message is that patients with contra-indications to thrombolysis and late presentation should more often be considered for primary angioplasty.

Thus ‘too late’ is perhaps not ‘too late for angioplasty’ but these interesting results need further investigation before recommending any major shift towards a more widespread use of angioplasty as the preferred treatment modality in patients with acute myocardial infarction.

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The Cardiology Information System: the need for data standards for integration of systems for patient care, registries and guidelines for clinical practice

Introduction

The building blocks come together, finally! Already three decades ago we were dreaming of the complete Cardiology Information System. However, at that time the computer programmers explained that it was too early. In the subsequent year information technology (IT) specialists, replacing the programmers, gave similar messages. Business interests of medical equipment industries seemed not to support data exchange; however this has changed in recent years. Now, finally the pieces come together. The bricks have been laid, the blocks have been made, and the system can be built.

The dream

For patient care, teaching, research and management, information is needed about the patient, the investigations which we perform, procedures and outcome. Each view on these data (patient care, clinical research, teaching, management) has its specific requirements, although these do overlap significantly. In the past, and still in many hospitals in the year 2002, the information required for different purposes is collected independently, with much duplication of work and possible errors. Wouldn’t it be great if information collected for one purpose could be made available for all other tasks, such that additional information might be requested only when not yet available? Wouldn’t it be great if this were to apply to both administrative data (address, date of birth, etc.) but also to the history, diagnoses and procedures performed?

Cardiologists and other physicians base their patient management on knowledge obtained during their training. Since the knowledge expands rapidly continuing medical education (CME) is required and provided by many different organizations such as the European Society of Cardiology. Yet, it remains difficult to keep up-to-date with new research results as presented at congresses and published in the journals, text books, and other documents. The European Society of Cardiology, as well as other societies, offers a partial solution to this problem, through creation of guidelines for prevention, diagnosis and management of cardiovascular disease. Yet, these guidelines also become too elaborate to be remembered in detail. Wouldn’t it be great if, upon request, the appropriate guideline information, as well as background material (journals, text books) were immediately available at your desk or at the bedside when a specific patient problem is identified?

Outcome research requires specific information on large groups of patients, with different characteristics and managed with different treatment strategies. Furthermore, patient-related information may be