neurohormonal agents in identifying patients who would benefit from different treatment strategies. This may also play an important role in the development of new drugs, such as antineurohormonal agents, which can improve the prognosis of acute myocardial infarction survivors. It also shows that echocardiography is still a very important player in risk stratification of patients post myocardial infarction, even in those who have a normal systolic function at discharge, since it can identify prospectively those who will develop left ventricular systolic dysfunction.

In conclusion, the assessment of neurohormonal agents at baseline in patients post myocardial infarction, together with the echocardiographic assessment of left ventricular volumes and ejection fraction at baseline and 3 months post myocardial infarction are important prognostic markers of left ventricular dysfunction and may help in the identification of patients who need a more aggressive treatment strategy in the setting of acute coronary syndromes.

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References


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Coronary angiography and revascularization for acute coronary syndromes without ST elevation: the next challenge

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The STRATEG-SIA study published in this issue is a registry of acute coronary syndromes without ST elevation in Argentina[1]. The aim of the study was to describe the management, analyse the factors influencing treatment and assess short- and long-term outcomes. Seventy-seven coronary care units (CCU) enrolled consecutive patients over a 1-month period. The major comparison was between two catheterization strategies. Patients were included in the invasive strategy if they received a coronary angiography procedure during the first 48 h of hospitalization and in the conservative strategy if not. The rates of death and myocardial infarction were higher at hospital discharge in the invasive compared to the non-invasive strategy, but at 1 year there was no apparent difference. Patients were stratified into high, medium and low risk using the AHCPR and NHLBI guidelines. Low risk patients who underwent revascularization showed a higher event rate than similar patients managed with medical treatment, but high risk patients who underwent revascularization had lower event rates than those managed with medical treatment. The investigators were concerned that lower risk patients were being selected for interventions. They conclude that a routine unselected invasive procedure is not associated with long-term benefits.

The observational nature of the study and the post-hoc stratification make comparison of efficacy of different management strategies prone to bias. The groups may not be balanced because of important differences in baseline characteristics for both known
and unknown confounders. Selection for coronary angiography is heavily influenced by the availability of facilities, local practice and patient symptoms. Thus differences in outcomes between the invasive and conservative strategies cannot be wholly assigned to the type of treatment irrespective of any statistical adjustments. Only patients admitted to the CCU were enrolled in the study. In a U.K. registry[5], only 38% of patients with acute coronary syndrome without ST elevation were admitted to the CCU. Thus the patient population in the STRATEG-SIA study is likely to be a subgroup of the patients with acute coronary syndromes treated in hospitals in Argentina.

Enrolment in randomized controlled trials in Latin America has been associated with higher mortality rates than North America and Europe[3,4]. Several studies set in Argentina have described clinical practice in patients with coronary artery disease. The ECLA 3 study described the characteristics and management of patients with unstable angina and emphasized the importance of risk stratification[5]. The ERACI II trial compared percutaneous coronary intervention employing stents with conventional coronary artery bypass graft surgery (CABG) in patients with multiveessel coronary artery disease. There was an unexpectedly high operative mortality rate of 5.7% in the CABG group compared to 0.9% in the percutaneous coronary intervention group (P=0.013)[6].

Guidelines have recommended that patients at higher risk for death and myocardial infarction should receive more intensive medical therapy and undergo coronary angiography and revascularization where appropriate. Recent data from the FRISC II[7] and TACTICS[8] trials appear to support this approach. Risk assessment is usually performed using baseline characteristics. However, post admission findings may have an important impact on prognosis. Cardiac marker elevation, impaired left ventricular ejection fraction, new recurrent ischaemic episodes, nuclear imaging showing ischaemia, and the extent of coronary artery disease in a coronary angiography add valuable information for the individual risk assessment and management of the patients. The extent and severity of coronary artery disease is one of the principal prognostic markers in patients with coronary artery disease. Identification of patients that require coronary angiography is a critical point in the management of patients with acute coronary syndromes. After coronary angiography three possible treatment strategies can be pursued: revascularization with percutaneous coronary intervention, revascularization with CABG or medical treatment. Individual risk assessment should be performed to select patients for coronary angiography. In general, patients with ongoing ischaemia, or recurrent ischaemic symptoms, are referred for coronary angiography. Low risk patients can usually be managed without early coronary angiography because the risk of the disease may be outweighed by the risk related to early invasive procedures. In high risk patients coronary angiography should be performed to determine the extent and prognosis of coronary artery disease. This group of patient includes patients with ST depression ≥1 mm, troponin levels ≥0·10 ng . ml⁻¹, heart failure, and evidence of ischaemia (either spontaneous or provoked). Age is recognized to be an important risk factor for adverse outcomes, yet most studies show that older patients are less likely to receive coronary angiography. Although older patients have a higher risk profile they may not necessarily benefit from revascularization because of higher rates of complications and co-morbidity. A careful analysis of the risk and benefit ratio of revascularization is needed for older patients especially those >75 years.

The STRATEG-SIA study raises important questions about adopting more invasive strategies in acute coronary syndromes. Recent randomized trials have supported a benefit of early angiography and revascularization in patients with high risk features[7,8]. How this translates into routine clinical practice where the selection process may be less stringent, there may be decreased availability of facilities, and variable operator skill, needs to be evaluated. Current evidence suggests that younger age, ongoing ischaemia and availability of facilities are the most important factors favouring early coronary angiography. Much work is needed to ensure that efforts are targeted at appropriate patient populations. What is clear is that coronary angiography remains an important, under-utilized diagnostic strategy in acute coronary syndrome, and revascularization in appropriate patients provides effective treatment. The STRATEG-SIA investigators are correct to raise these important issues for debate.

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References
Intracoronary brachytherapy is the first method which has been effective in two components of restenosis, intimal hyperplasia and negative remodelling. Several randomized studies have demonstrated that brachytherapy is effective in restenosis. Its subsequent approval for clinical use has made it a routine procedure for the treatment of in-stent restenosis. In Europe, intracoronary brachytherapy is performed in more than 150 sites. It is estimated that 4000 procedures were carried out in the year 2000, which is still a conservative attitude when compared with the 350 active sites and 30,000 procedures estimated for the United States. The initial studies used γ radiation[1–3] while more recent trials[4,5] have confirmed that similar benefit can be obtained with β radiation. The advantages of β sources include rapid attenuation of radiation, minimized exposure of physicians and staff, reduced shielding requirements and the usage of more intense sources allowing shorter dwell times. Almost all the European centres use β radiation with three systems: Novoste Beta-Cath, Guidant Galileo and Radiance RDX, which received the CE mark recently. The results obtained with brachytherapy in de novo lesions are more controversial and limited information is available for the application of this system in a wide range of indications. This explains the interest in the study presented in this issue by Regar et al[6] with the Novoste system, applied in 108 consecutive de novo and restenotic lesions.

Is the news good? Yes indeed in terms of feasibility. Even with the stiff 5 Fr delivery catheter, already replaced by a 3.6 Fr more flexible catheter, the success rate of device insertion is 100% with some additional dissections (nine lesions, 8.3%) and an acceptable increase in procedure duration (dwell time of only 3.3 min).

What about late outcome? As a reviewer I was shocked by the contrasting messages from the first version of this study, limited to 6 months follow-up with the recent version, with a complete 1 year follow-up. The worst prophecies, that brachytherapy delays but does not solve problems, seem to be confirmed. Myocardial infarction occurred in nine patients (9%) during the first year following the procedure. Most of the events occurred between 6 months and 1 year and, as the follow-up was stopped at 1 year, it is possible that new events will occur later. The percentage of target lesion revascularization may appear lower than expected (23%) for this complex lesion selection, but two worrisome some aspects must be considered. Restenosis is reported to have occurred proximal or distal to the treated segments. This was despite the fact that this skillful group of pioneers of vascular brachytherapy made every attempt to avoid incomplete coverage of the lesion, reported only in 8% of cases, using very long sources (60 mm) or pullback of the